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THE PAPER INDUSTRY

JULY, 1935
Vol. 17—No. 4

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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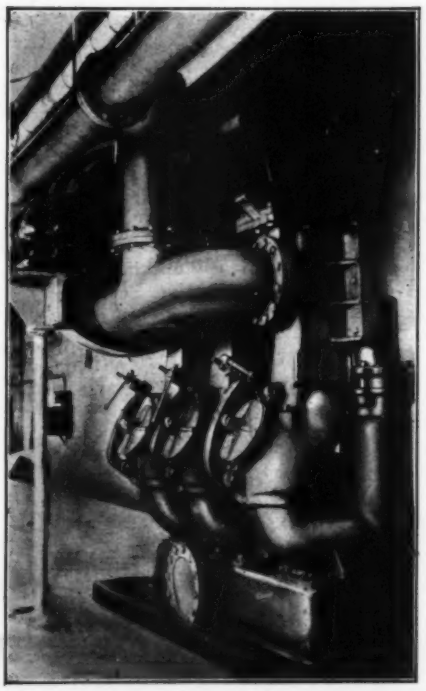

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What's the Matter With Business?

EVERYONE knows that there is something wrong with business. That is the question every business man asks his neighbor wherever two or three of them are gathered together.

There has been a let-down. There is a lull. What's the matter?

As we scan the index of business activity, it shows that for the first six months of this year, the business activity is consistently under the 1934 figures and during the month of June has turned sharply downward. Why?

These puzzling questions are being asked by business men because of their disappointment. They believed, and were led to suppose, that by this time, business activity would certainly expand and be showing a consistent upturn in activity every month.

Every business man honestly believes that business should be expanding; instead, it has been contracting.

Two years ago, when the present administration came into power, the President of the United States announced in behalf of his administration that they were going to solve the depression, put idle people to work and restore business activity.

The administration displayed commendable eagerness in attacking the employment and commercial problems. Congress was called into immediate session and the result of the Presidential messages and congressional deliberations was that a National Industrial Recovery Act was passed by Congress and presented to the people.

In spite of inherent misgivings as to the workability of the Industrial Recovery Act, the act was accorded wide-spread support. The people backed the President and helped him push the plans for industrial recovery to completion.

However, the Industrial Recovery Act was supplemented in the succeeding Congress and the one at present in session by continuous new reform experiments so drastic in objective that at each announcement, the progress of recovery was halted until the activity curve is distinctly downward today.

Last week in New York City, a group of paper men debated the question "What's the matter with Business?" A report of the discussion reads as follows: "The consensus of opinion is that the difficulty is lack of confidence."

Now, the report does not give the details of the discussion, but if the "lack of confidence" means lack of confidence in the President and the present administration, we heartily concur in their consensus of opinion and we have no reservations in saying that we believe that lack of confidence in the administration and its announced legislative objectives is the cause for the diminishing business activity.

As we further scan the chart of business activity, we note that at the present time, the business activity figure is five points under that of December, 1932, during the closing months of the Hoover administration. In other words, in spite of the splendid cooperation that business and industry have given the President and his administration in behalf of the Industrial Recovery Act, and in spite of the gains that were made up to six months ago, there has been a decided downward trend in recovery until at the present time, we are forced to the conclusion that we are lapsing back into the same degree of innocuous business desuetude that we experienced in the final months of Hoover's regime.

What's to be done about it?

Clearly, the claim that politicians could initiate and

administer the industrial recovery of this country has been a failure. There is but one alternative as we see it—Industry, Commerce and Business must immediately bestir themselves and accomplish their own recovery. It has proved to be an idle dream to suppose that politicians could legislate industrial recovery. The proper legislators and administrators of industrial recovery are the business and commercial men of the nation. Unless they arise to the emergency and prove their ability to accomplish their recovery, we shall lapse into a secondary phase of depression that may prove more costly than the one we sought to escape.

What's the matter with business?

Too much party politics and too little sane economy.

Horsepower and Wage Earners

SOME rather interesting facts on industry have been revealed through a recent study made by the National Industrial Conference Board for the National Tool Builders Association. The study, based on a survey of power used per wage earner in fifteen different industries, showed among other things that the paper and allied products industry employed more power per wage earner than did any of the other fourteen industries in the study. In 1914, this figure for the paper and allied products industry was 10.2 horsepower per wage earner. There was a drop from 10.2 to 9.5 horsepower per wage earner for the year 1919, the next year indicated by the survey, and then an increase to 10.6, 11.6, 12.5 and 13.6 for the years 1923, 1925 and 1929 respectively, the other years considered in the study.

The industry with the lowest horsepower per wage earner was leather. In this industry the horsepower per wage earner was approximately one-tenth of that for the paper and allied products industry, the horsepower per wage earner in this case being 1.0, 1.1, 1.2, 1.3, 1.3 and 1.4 for the years 1914, 1919, 1923, 1925, 1927, and 1929 respectively.

Without reference to relative position in the findings, the industries other than paper and allied products and leather mentioned in the study were food and kindred products; textiles and their products; forest products; printing, publishing and allied industries; chemicals and allied products; products of petroleum and coal; rubber products; stone, clay and glass products; iron and steel and their products not including machinery; non-ferrous metals and their products; machinery not including transportation equipment; transportation equipment—air, land and water; and railroad repair shops.

Although an analysis of this study indicates that the leather industry is the least mechanized and the paper and allied products industry the most mechanized, every critical student of pulp and paper making recognizes that mechanization in the industry has by no means approached the ultimate. Much has been done, to be sure, to minimize the physical burden incident to some of the work in the industry of a generation or two ago, and to produce paper in greater tonnages at lower production costs. In fact, the modern industry has been built upon such progress, but under no circumstances should anyone be satisfied to stop there.

There are yet so many opportunities for simplification of processes, for more efficient production methods, and for the manufacture of better paper and paper for new uses that the industry stands as a challenge not only to the machine producing industries which supply it with machinery, but to the men within the industry itself. May this challenge not go unaccepted but rather may it stimulate thought and action to the betterment of the industry and of those who constitute it.

The Suggestion Box

HAVE you capitalized on the suggestion box idea? If you have such a box, is it located somewhere in your plant where it is convenient to the largest possible number of your employees, or do you have such boxes scattered throughout the mill? In either event, has the idea been found a helpful one?

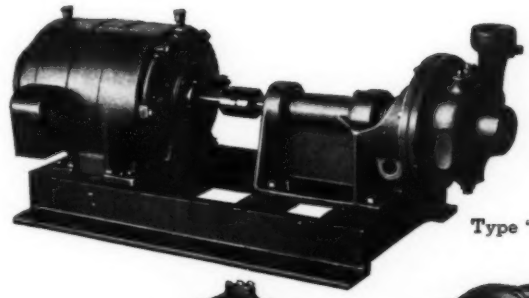
If the idea has not shown some practical benefits, are you sure that you have done your part with it? Have you made it worth the while for each of your employees to contribute suggestions or do you simply take it for granted that they should contribute without reward of any kind?

It must be remembered that no one, no matter how learned or skilled, has all of the worthwhile ideas. Sometimes from least expected sources ideas of practical merit may unfold themselves if given the proper opportunity. Perhaps most of the ideas thus obtained may be in the rough but some of them when polished up may prove to be diamonds of great worth.

There is an old saying that "two heads are better than one." In this instance there is an opportunity to profit from the knowledge and experience of your entire organization so how much more worthwhile that ought to be.

Surely, if you have tried the idea and found it wanting, or if you have not tried it at all, there is no better time than now to give more thought to it. It may be a means of stimulating progressive thought throughout your entire organization.

Hot or Cold Acids Pumped *Efficiently*



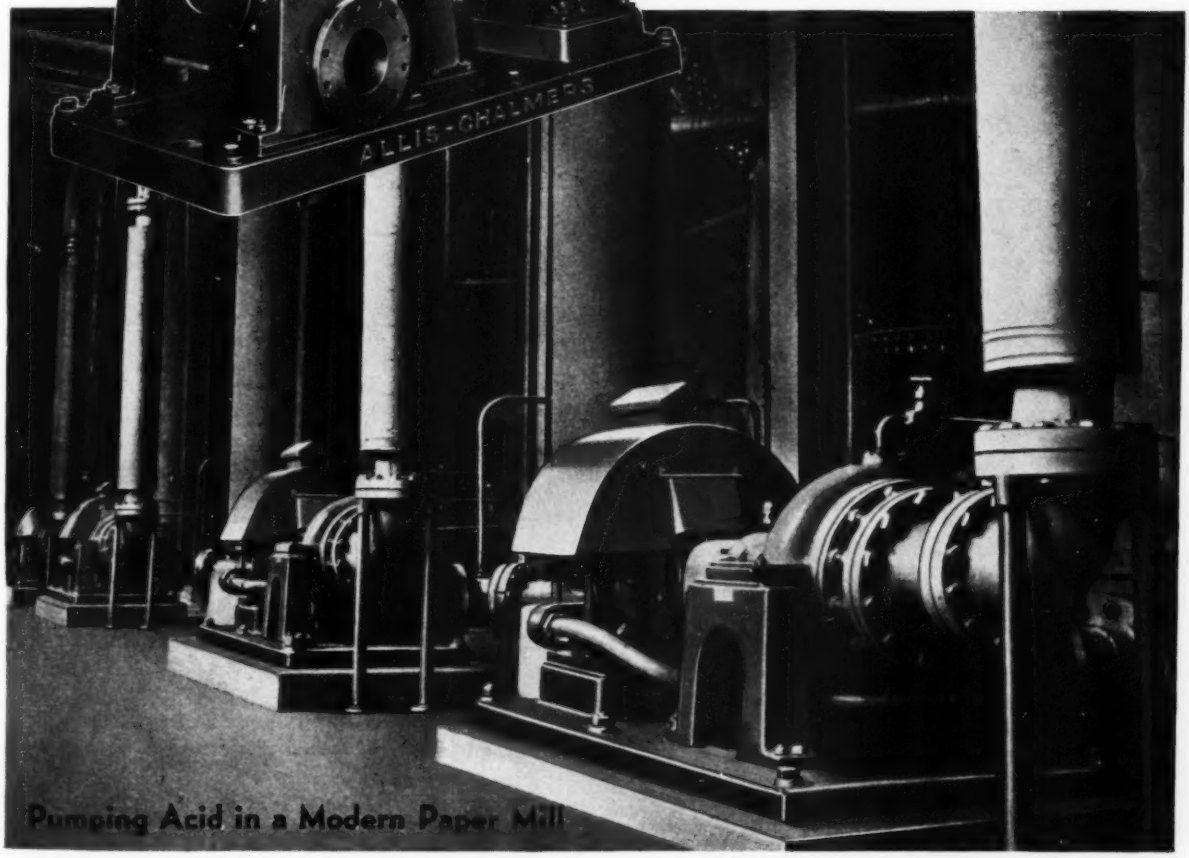
Type "SSB"

THESE pumps were designed to meet the demand for high grade units to handle acids in process work. They are of the single suction type and are made of Monel Metal or Chrome Steel.

A number of type "SSA" pumps are in successful operation handling hot acids. These pumps were made of special Chrome steel. On account of the high temperatures the casing is supported on the horizontal center line by brackets and is also keyed on the vertical center line underneath the water cooled stuffing box.

Type "SSB" pumps are smaller but are built along the same high grade lines and of high grade materials. They are suitable for pumping liquids which cannot be handled by ordinary water pumps. Due to the simplicity of its design its cost has been kept very low. A large number of these pumps are in daily use in various processing industries.

Type "SSA"



Pumping Acid in a Modern Paper Mill

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CURRENT THOUGHT

Constant Change

By WILLIAM SIBLEY

THE only thing that is constant in this world is—change. Slow and painful elimination awaits the business man or politician who forgets that fact.

The recent news of the biological accomplishment of the famous Lindbergh again forces home the realization that this, more than any other, is the age of change. The amazing Lindy piloted a man-made, synthetic bird and successfully spanned the three thousand miles of water which separates the two continents. Now he has made and piloted a man-made, synthetic organism which spans the infinitely greater gulf between life and death. With this latter machine he can keep alive and functioning the organs of the human body long after they have been removed from their natural moorings. For the one accomplishment he met with the acclaim of the world and was rewarded with fame and fortune. For the other accomplishment he again meets with acclaim; his reward being chiefly the knowledge that through his efforts medical science has been vastly furthered, human suffering greatly alleviated.

But this is not a eulogy of Lindbergh, however bright and tempting that subject might be. Rather it is another plea for the recognition of synthesis—that art of putting together unrelated parts for the production of something new—something that is changed. No business, much less the paper industry, is free from the possible devastating effect of change.

Not long ago I wrote and directed the production of a catalogue. The cover of this catalogue I ordered finished with "liquid Cellophane" and the use of this comparatively new finish so sparkled the printing and increased the brilliance of the book that it obviated the necessity for a four-color cover, thus robbing the engraver of a profitable job, the printer of 160,000 impressions, and the ink manufacturer of the sale of many pounds of ink.

In the transportation field the importance of change is even more apparent. Out of Chicago four railroads are now operating modern "stream-lined" trains. In one instance the train that travels from Chicago to the Twin Cities is a standard steam locomotive and standard passenger cars made stream-lined by design. In another instance, the train that makes the same trip, over a different route, is of the newer stainless-steel, Diesel-powered type. Both can make the trip in 5½ hours; both are far more economical to operate than the old type of train. But the fuel cost of the steam-powered train on this trip is about $115, whereas the fuel cost on the Diesel-powered stream-line train is about $11. Another train of exactly the same design (stream-lined stainless-steel, Diesel-powered) made a non-stop run from Denver to Chicago last summer—not only in record time, but on a fuel cost of $17.50. It would take a banker conservative indeed to refuse the plea of re-equipment and abandonment of old rolling stock when such savings are possible.

Two or three weeks ago I flew from Chicago to New York City, my plane being one of the twin-motored Douglas. While getting a cup of coffee in Cleveland the pilot told me that formerly the little 2½-inch diameter pole which supported the plane's radio antennae was four feet high. Now it is only two feet high—and the cutting of two feet off that little pole made a difference of 3 miles an hour in the plane's speed. The recessing of the wheels and undercarriage after taking off makes a difference of 21 miles an hour, according to this one pilot.

Nothing can escape the onrushing tide of endless change. Each year we will see more and more articles produced by different methods, and more and more methods accomplished by different materials. Our own product—paper—is today used for hundreds of things that were undreamed of a few years ago. What tomorrow's development in paper will be, only the chemist, the physicist and the scientist can answer—tomorrow. That they will come, however, is as certain as the dawn. That we should do everything in our power to accelerate the speed of their arrival is only business sense. I would rather sell a carload of paper in the form of bathroom rugs than in the form of butcher's wrapping paper, since undoubtedly there would be greater profit therein. The more uses we can develop for paper the more prosperous will be our industry.

Synthesis is the accepted method for market development nowadays. Today it is absolutely imperative, from the standpoint of commercial existence, that we not only keep abreast of all things synthetic and adopt such changes as will be beneficial to us, but that we do everything possible to effect expanding changes in, for, and with our product—paper. To live today we have need to think in terms of ten, twenty or thirty years from now. In purchases, production or sales present day conditions demand that we not exceed the immediately visible. In research and market development we must have the vision to see far into the future; the conviction to plan for that future; the courage to work for that future. Only by so doing will we be dominant when the "future" finally becomes "today."

THE PAPER INDUSTRY
A MONTHLY EDUCATIONAL JOURNAL

An Insurance Yardstick for Plant Executives

CARLL S. DOWNS

THE depression has made plant executives analyze costs, scrutinize markets and retrench in every possible way. It has also put insurance buying on the chief executive's list of important duties and created a need for an accurate scale to measure the quality and costs of all forms of business insurance—casualty, liability and fire insurance.

There is a particular need for such analysis in the paper industry due to the fact that most paper mills run to extremes. They are either very good as an insurance risk or very poor. If good, they may have developed an experience credit over manual rates. If poor, they are paying a rate which is loaded for their past experience.

A good insurance company, when properly considered, can do much to lower insurance costs and at the same time offer complete protection. It, therefore, behooves the insurance buyer to consider all insurance companies from the standpoint of what they can do for him. He must know how they can cope with his individual problems and in time of need how they will justify his decision in selecting them as his carrier.

Some $650,000,000 is spent each year by American industry in insurance premiums for various forms of casualty insurance to protect itself against losses for which it is legally liable. Approximately 800 companies share this annual premium. Is it any wonder that the insurance buyer may find himself depending too much on the advice of some individual agent or broker as to what is the best company for him. Many executives with a thorough knowledge of policy forms and legal requirements leave the selection of the carrier to some one else. What good is a standard policy contract if the company behind it is sub-standard for reasons not apparent in a handbook of insurance companies.

The following yardstick has been developed so that a man may use the same judgment and foresight in selecting an insurance company that he would employ if he were to risk his own money in the stock market.

In outline form, your insurance yardstick would appear as follows:

1—General reputation of company
2—Character of policy holders
3—Trend of growth of company
4—Profit earning record
5—Income and disbursement record
6—Loss ratio
7—Expense ratio
8—Accident prevention
9—Claim settlement
10—Final net cost
11—Coverage advice

The general reputation of the company might best be referred to as its standing in the field, the kind of representatives it attracts, and the comment it provokes when referred to in competitive bidding.

The character of its policyholders is probably the best recommendation any company can have, and the length of time those policyholders have been with the company is also a matter of vital importance. There is tendency to switch carriers when service is mediocre, and claims are indifferently handled. A company with an imposing list of clients who have been policyholders for five years or more is worthy of serious consideration in these days of sharp competition and price buying.

The growth of a company bespeaks of management, and management is the life blood of any organization. The strength of a company lies almost entirely in its

management. When considering management, ascertain:

Who are its directors and executive officers?

What is its position as shown by the current balance sheet as regards (a) assets, (b) liabilities for reserve, (c) contingency reserve to meet possible fluctuations in securities, (d) surplus? Is it increasing its assets and surplus?

If an insurance company is earning money on current operations and showing reasonable additions to surplus, it is a much safer buy than a company which has been unable to operate within its income and is in danger of being forced to sell securities at market to pay current obligations.

What is its record of premiums written? If it has shown ability to substantially hold its own, it is reasonable to assume that its business is progressively managed and will not be handicapped or defeated in an effort to adjust expenses to income without drastically curtailing service.

Is its business diversified by lines of insurance written and does it do business in enough states to provide a sufficiently wide spread to give the law of averages an opportunity to stabilize its operations? All sound insurance rates are based on the law of averages, with periodic adjustments to equalize without penalizing the buyer with high rates. If an insurance company has a large part of its total volume in one line, for example, it will find it much more difficult to adjust itself to changing times and conditions. If a company confines its operations to one or two states, it will be in a much weaker position than a company which operates nationally.

Does it control losses by careful underwriting or is it known as a company which writes hazardous "high loss" lines? If its ratio of losses to income is higher than the average, it is not efficiently managed. Does it cut rates for competitive purposes or does it maintain a fair rate level? No company can endure permanently if it cuts rates. A high loss ratio is a storm warning of rate cutting or poor underwriting or both. Skillful mariners heed storm warnings especially in uncharted seas.

What is its expense ratio; i. e., how much does it spend out of each dollar of premium income to sell, service and handle its business? If its overhead is too high, relatively, it is not efficiently managed.

Does it give good accident prevention service on liability lines or good fire prevention service on fire lines? There are several ways of measuring these two factors. Ask its policyholders and look at its record of growth. The good safety engineer explains to the policyholder exactly how his insurance rate is made up and what he can do to lower it. He also points out that the indirect accident cost to the employer is several times the direct cost to the insurance company.

Does it settle claims and losses promptly and fairly? Here again ask policyholders.

What would have been the net cost for insurance in company A, company B, etc. in 1932, 1933 and 1934?

Casualty insurance is constantly changing to meet current conditions in specific industries as well as to conform with various state legislations. The proper type of policy for one company might be money wasted for another company, even though both companies had the same general hazard against which to protect themselves. A progressive company is only too glad to check policies and make a policy survey to insure uniformity of coverage and eliminate duplication.

Insurance is one of the least understood of all business services. The insurance business itself is largely to blame because it has never clearly explained insurance to the insurance buying public. Actually, insurance is as definite as tomorrow's sunrise, and it can be timed as accurately as a fine watch.

Through tradition and habit, insurance has been sold too generally on an unsound basis and it is frequently sold on an equally unsound business relationship basis. But times are changing and responsible executives know that such methods are wasteful and dangerous.

Insurance should be bought as carefully as any expert buys silk, wool, leather, paper or other commodity. And finally, insurance can and should be bought to exact specifications.

◆ ◆ ◆

Essentials for Research Work[1]

IN THE present state of technical knowledge in our industry, where research has so far been individual and rather spasmodic, a few words of advice to the mill chemist may not be out of place. The first essential for research is not a desire to experiment, but rather a natural curiosity towards arriving at conclusions based on observation. This requires patience and a sound knowledge of elementary logic, combined with some imagination. Too much reliance should not be placed on authority and text-book theories. Take nothing for granted that does not agree with your own experience and observation. Experience proves that it takes approximately twenty years to establish a new theory and another twenty before the text-books adopt it.

In the process of inductive reasoning towards the establishing of a tentative theory, a very large number of observations are required as a basis.

The most common fallacy in formulating a theory lies in failing to give consideration to a sufficient number, or a sufficiently wide aspect, of observations.

On the other hand, do not imagine that failure to prove a certain conclusion in any way proves the opposite or that a single negative observation has any substantial weight in upsetting a hypothesis which is based on numerous positive observations. The wider the field and the more numerous the observations on which a theory is based, the more likely is its truth as measured by its adaptability to include fresh observations. It is not wise to jump to conclusions or to dogmatise about a hypothesis until the latter is confirmed by a very long-continued series of observations.

Errors do not generally lie in observations but in the conclusions arrived at from them, and "the more readily we admit the possibility of our own cherished convictions being mixed with error the more vital and helpful whatever is right in them will become" (Ruskin).

(1). From "Routine and Research in the Paper Mill," by James Strachan, published in *The Paper Maker and British Paper Trade Journal*, June 1, 1935.

Twenty-Five Years of Research

C. E. CURRAN
In Charge, Section of Pulp and Paper, Forest Products Laboratory[1]

ON JUNE 4, 1935, the U. S. Forest Products Laboratory celebrated the twenty-fifth anniversary of its establishment on the campus of the University of Wisconsin at Madison. The Laboratory is the technical organization that, as a unit of the Forest Service of the U. S. Department of Agriculture, deals with research and development problems involved in improving and increasing the utility of forest products. One of the important activities under this program of forest products research is the work in pulp and paper.

When the Laboratory was formally opened in 1910 it was housed and equipped with what at that time were considered the most modern facilities. The equipment included a combination fourdrinier and cylinder paper machine, beating and jordan engines, a small chipper, pulp digesters, a wet machine, a pulp screen, and the standard pulp and paper testing devices then available. This original equipment and the methods of technic developed for their use have been described in an article by Kress, Wells and Edwardes[2] published a number of years ago. The object of this article is to describe the improved pulp and paper research facilities which have been made available recently.

The original Forest Products Laboratory building provided by the University of Wisconsin, which in 1910 had seemed so commodious, soon became crowded and three additional buildings on the University campus became occupied either wholly or in part by the laboratory staff.

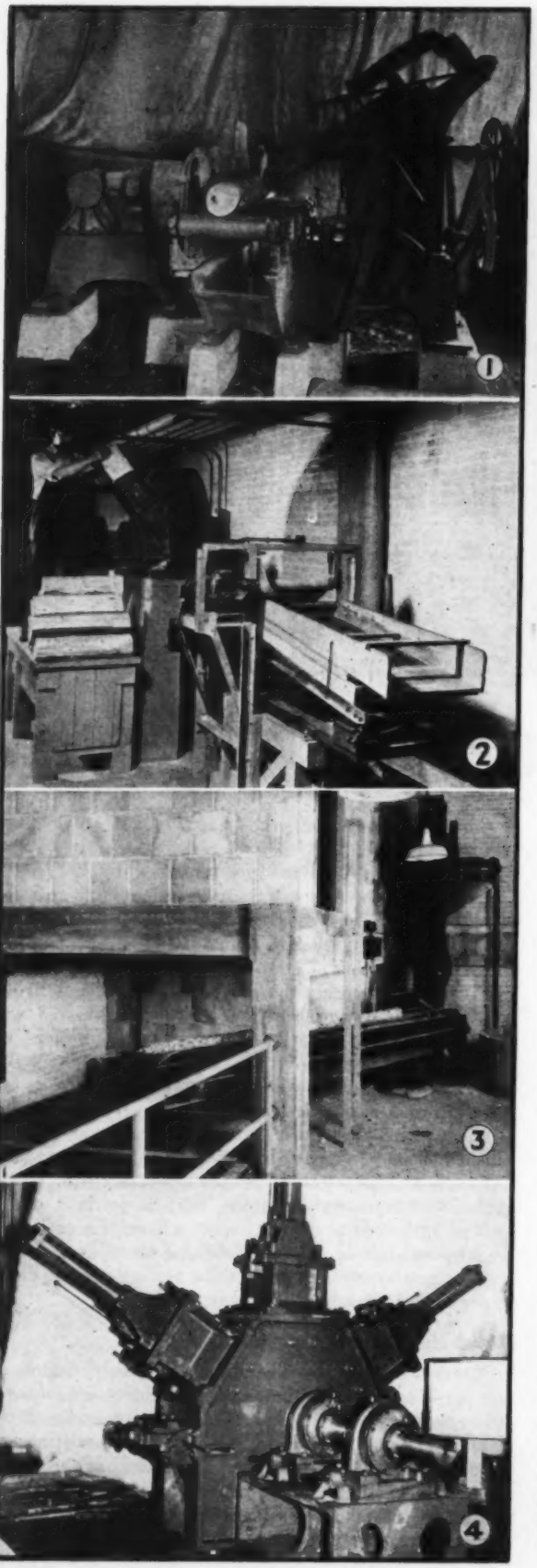
In 1931 this situation was remedied by a federal appropriation for a new building large enough to completely house all the sections of the Laboratory. This building was completed in 1932. It should be pointed out that the Section of Pulp and Paper is but one of the eight major research units composing the Forest Products Laboratory organization. No attempt is made here, however, to describe the work or equipment of these other sections except in a few instances where the fields are interrelated or closely allied to the work of the Pulp and Paper Section.

The equipment of the pulp and paper laboratory consists of machinery for handling and preparing wood, pulp grinders, digesters ranging in capacity from a few grams to one thousand pounds, beaters, jordans, a rod mill, a fully equipped wet room, a fourdrinier paper machine producing a 12-inch trimmed sheet, and several special laboratories devoted to the testing of pulps and papers and research in all phases of the field.

Wood Handling Equipment

Wood is usually received at the Laboratory in lots of two cords or more and immediately subjected to a careful evaluation. At the time of its selection and cutting, data are taken relative to such growth conditions as type of soil, climate, density and character of the stand. Upon arrival at the Laboratory accurate determinations are made of such factors as growth rate, density, proportions of heartwood and sapwood, springwood and

1. Forest Service, U. S. Department of Agriculture, Maintained at Madison, Wis., in co-operation with the University of Wisconsin.



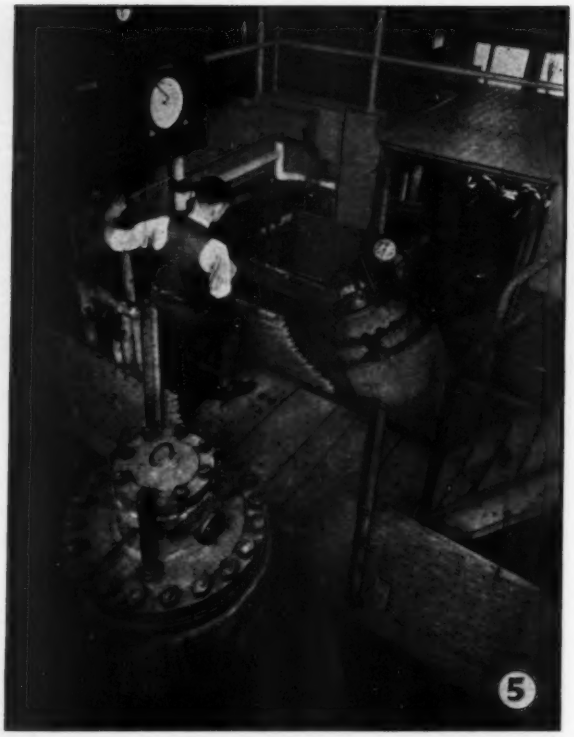


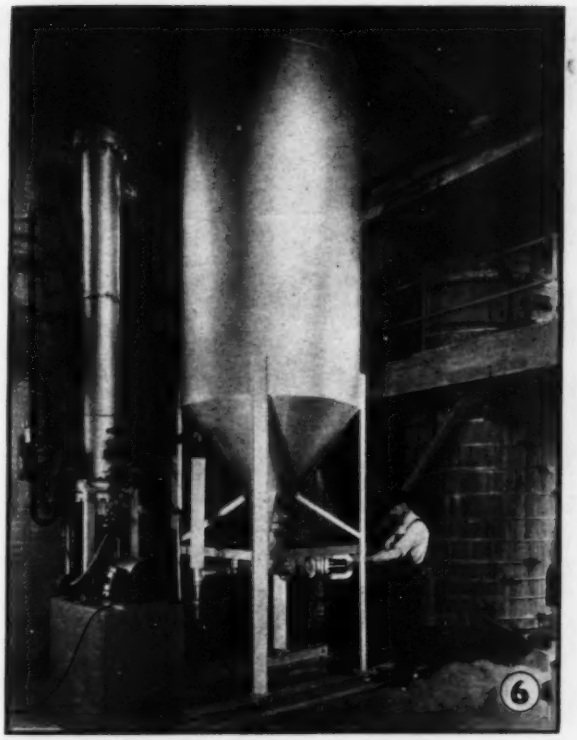
Fig. 1—Mechanical barker
Fig. 2—47-inch disc laboratory pulpwood chipper and chip screen
Fig. 3—Chip bin and conveyor
Fig. 4—Experimental 3-pocket pulpwood grinder
Fig. 5—Tumbling digesters—50 pounds pulp capacity

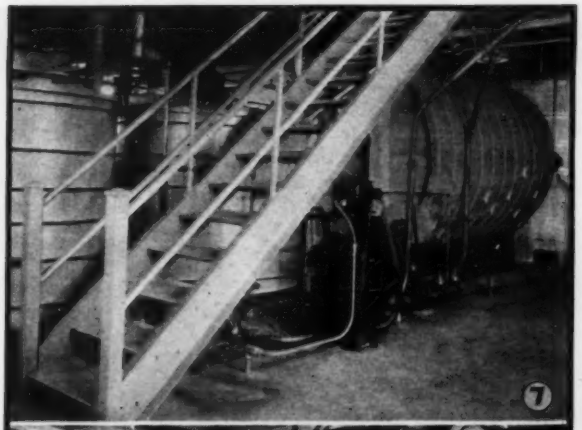
summerwood, color, and chemical composition. An immersion tank, with capacity sufficient for an entire cord of wood is available by means of which volume displacement can be determined. Various cord racks are at hand as well as a small, portable crane for convenient handling of wood or other materials.

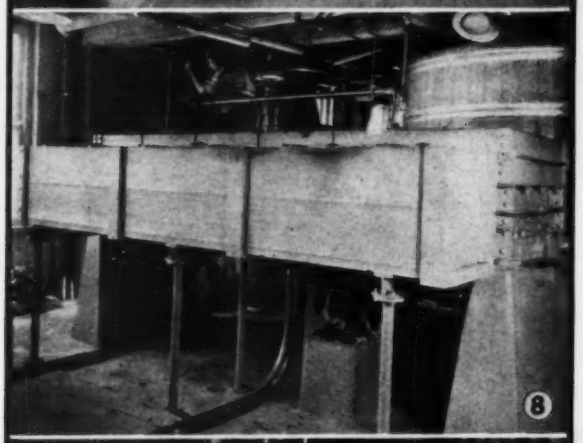
The Laboratory is equipped with a head rig and band and swing saws for "breaking down" large logs or for cutting pulpwood to any size or length desired. The sawn pulpwood is either hand barked or, where large quantities are handled, barked on a mechanical barker (Figure 1). If chemical pulping experiments are contemplated the wood is chipped by means of a 47-inch chipper and then screened (Figure 2). It is next conveyed mechanically either to storage cans or to a chip bin (Figure 3).

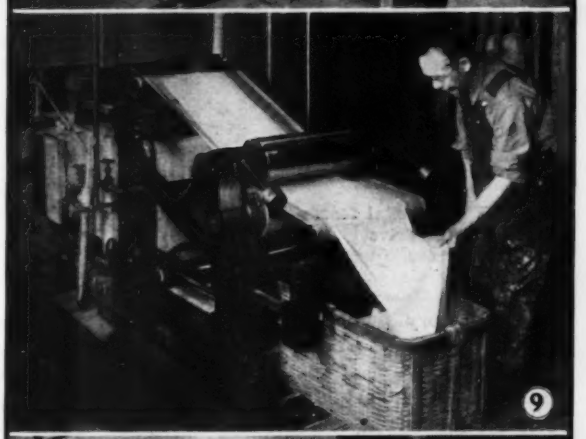
Pulp Grinders

For groundwood pulping studies two grinders are at present available. One of these is a small, two-pocket grinder equipped with a 24-inch diameter stone with an 11-inch face and driven by a 75-horsepower motor. A larger grinder recently installed carries a stone 54 inches in diameter with an 8-inch face. It has three pockets and is driven by a 350-horsepower motor. A unique feature of the larger grinder (Figure 4), is that the stone is not mounted between the bearings but is overhung by means of bearings at the back. This mounting permits quick change of stones without disturbing the bearing alignment. A full description of this









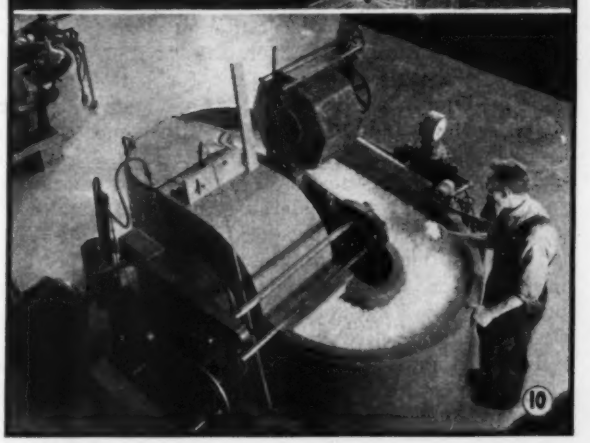


Fig. 6—1000-pound capacity alloy-steel lined pulp digester with circulating equipment and blowpit
Fig. 7—Machine chests and stock chests
Fig. 8—Flat plate screen
Fig. 9—Laboratory wet machine
Fig. 10—50-pound capacity experimental beater

grinder has been published recently[3]. The accepted stock is passed over a "bull screen" and pumped directly to a stock chest from which it can be "lapped" from a wet machine. The grinders are fully equipped with controls for pressure, temperature, speed, and other grinding variables. Both large and small grinders are supplied with natural and artificial stones of various types.

Pulp Digesters

Four pulp digesters of semi-commercial size constitute the chemical pulping equipment. Two of these are of the tumbling type (Figure 5), having 13 cubic feet capacity and producing approximately 50 pounds of pulp per charge. One is lined with a chrome-nickel-alloy steel and is used for sulphite acid pulping. The other is of ordinary carbon steel construction and is used in experiments in the alkaline processes. Both are capable of operation at pressures up to 400 pounds per square inch, are jacketed so that they may be used with either direct steam or indirect heating, and are equipped with pressure and temperature control and recording instruments for automatic control. Their size is ideal inasmuch as they co-ordinate perfectly with the small paper machine, particularly in view of the fact that most of the cooking experiments at the Laboratory are done on a 50-pound scale.

The third digester is a 300-pound rotary boiler of the type commonly used in rag pulp mills. It is capable of withstanding pressures of 125 pounds and is used at

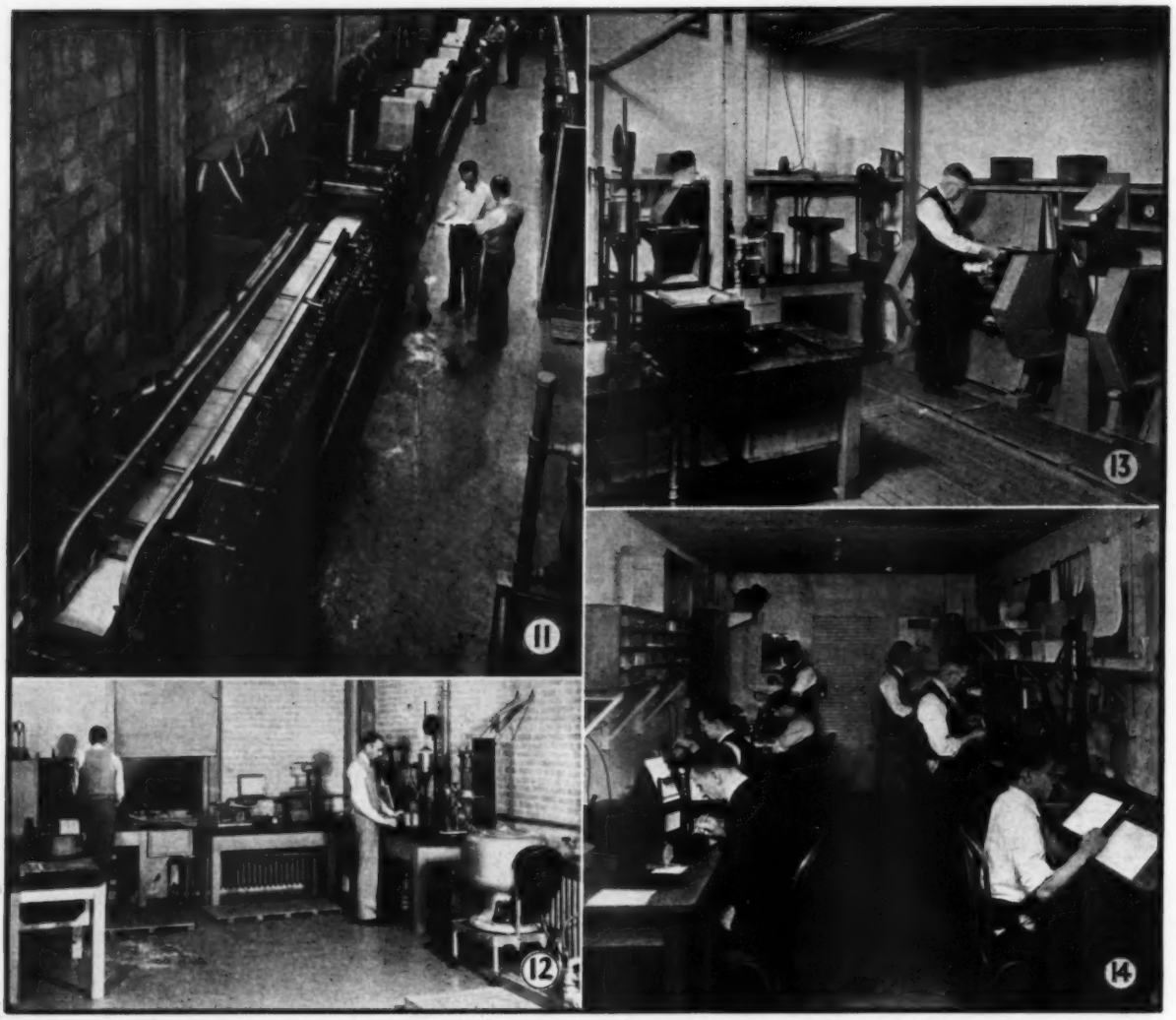


Fig. 11—Experimental fourdrinier paper machine with electric drive

Fig. 12—A corner in the pulp evaluation laboratory

Fig. 13—Pebble mills and sheet making equipment for pulp evaluation

Fig. 14—Controlled humidity room and pulp testing instruments

the Laboratory principally in connection with semi-chemical pulping. The fourth digester, just installed, has a capacity of 225 cubic feet and will produce approximately 1,000 pounds of pulp per charge (Figure 6). It is a stationary chrome-nickel-alloy lined digester provided with an outside circulation system and designed for a maximum operating pressure of 400 pounds. Suitable liquor systems for both acid and alkaline liquors are available. A weightometer for charging chips, an automatic temperature and pressure control, and suitable blow pit and stock lines are provided. A large digester in an experimental laboratory fulfills the need for considerable quantities of pulp of known characteristics produced under entirely controlled conditions. Such pulps are required in processing and paper machine studies and for production of pulps in commercial quantities when mill scale demonstration runs are necessary.

In addition to the four digesters mentioned, the Laboratory makes constant use of four autoclaves of from three to five pounds capacity. Smaller scale pulping is conducted in bombs holding a few grams of raw material. The customary procedure in any systematic investigation of a given pulpwood is to begin with the small scale equipment where all operations can be strictly quantitative, and to carry the project through to the larger digesters only after satisfactory cooking methods have been developed.

Pulp Handling Equipment

The wet room of the Pulp and Paper Laboratory provides ample stock and stuff chests of the type shown in Figure 7. A large flatplate screen (Figure 8) and two wet machines, one of which is illustrated in Figure 9, are available. Since experimental pulping work is always on a quantitative basis, great care is exercised in washing the stock in the blowpits and transferring it either by means of large cans or through stock lines to the slush chests and over the screens to the wet machine. All screenings are dried and weighed and moisture samples are taken of pulp being lapped on the wet machine so that the yields can be calculated readily.

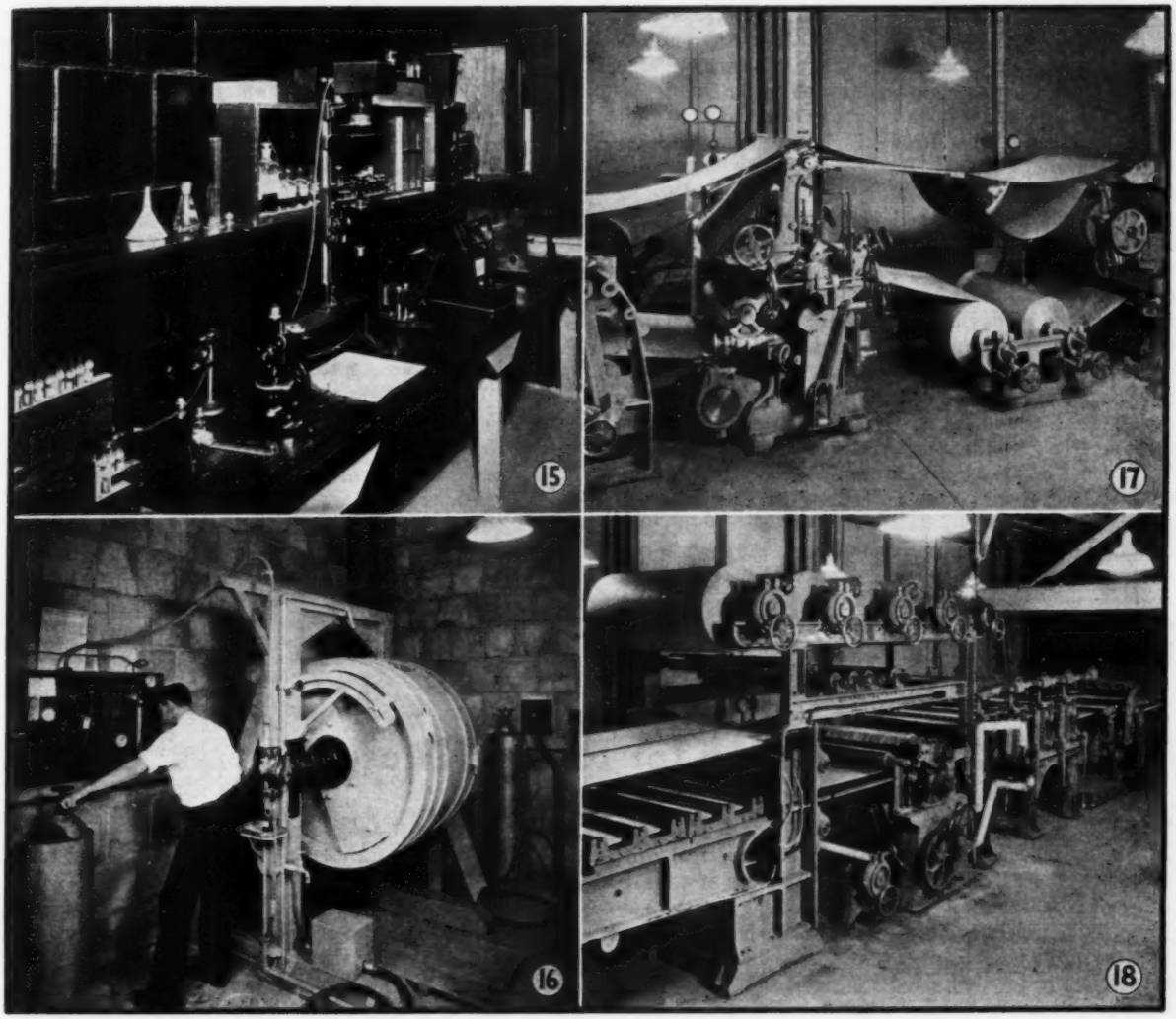


Fig. 15—Dark room and optical laboratory
Fig. 16—Chlorination bleaching drum with flowmeter
Fig. 17—Corrugating unit of the board fabricating machine
Fig. 18—Pasting unit of the board fabricating machine

Separate chests, stock lines, and wet machine are used for the 50-pound and 1,000-pound operations. The same screening system, however, serves both operations.

Beating Devices

All pulp is furnished to the experimental paper mill in the form of wet laps. These are opened in standard hollander type beaters of which three are available. The beaters range in size from 10 pounds to 50 pounds; one of the latter size is shown in Figure 10. All beaters are equipped with bronze tackle and are provided with roll set recorders. A device has been developed and installed on the 50-pound beater for controlling temperatures within limited ranges.

Other beating engines available are a 3 by 5-foot rod mill of standard construction, a small kollergang and two baby jordans. While the latter possibly may be considered as a direct part of the paper machine set up, they are nevertheless fitted in such manner that they can be used for processing investigations. Both jordans have a unique pneumatic control on the plug so that the plugs can be remotely adjusted and maintained at any desired pressure without the use of a hand wheel. This arrangement insures uniform action irrespective of consistence, stock volumes, and temperature, and facilitates instrument control and recording of processing conditions.

Papermaking Equipment

The present paper machine is shown in Figure 11 This machine was installed at the Laboratory between 1910 and 1912 at which time it consisted of a combination cylinder and fourdrinier forming end, two presses (one reversing), nine driers, and a calender stack of eight rolls. The drive was the conventional mechanical cone pulley type. The maximum speed was about 40 feet per minute. A rather detailed description of certain parts of the machine was presented recently in an article by Chilson and Baird[4].

This papermaking equipment has been developed progressively as the need for improved control and the measurement of paper machine variables became more

obvious. At present, the wire forming end has been increased some 2½ times its original length; one additional straight press and a smoothing press have been added, together with eleven additional driers, and provision has been made for a breaker stack or sizing rolls when required. The drive has been changed to the self-synchronous electric motor type. The machine is now capable of operation at speeds from 8 to 250 feet per minute and is equipped with numerous controls of the process conditions. It produces a sheet approximately 12 inches in width and is adapted to the production of any kind of stock from tissue to board and from blotting to glassine. All controls are of the remote type and at the convenient command of the machine operator. Recording instruments and other control devices are grouped on a panel so that only a glance is necessary to determine how various parts of the equipment are functioning.

Figures 12, 13, 14, 15 and 16 give views of various testing laboratories and miscellaneous equipment of the Pulp and Paper Laboratory. The pebble mill method of strength development is the standard in current use, although continual work is under way to evaluate new methods of pulp testing as they come out and to developments which may be of service to the industry.

Three other sections of the laboratory are doing work of direct interest to the pulp and paper industry. The Section of Timber Mechanics is now extensively developing work on fiber containers. In this section there has recently been installed a corrugating and pasting machine (Figures 17 and 18) used incident to the production of containers, which are designed, produced and tested under service conditions; the Section of Derived Products is studying the microscopical or fine structure of wood, and also the chemical character of wood components; and, the Section of Silvicultural Relations is actively engaged in investigations dealing with fiber analysis, pulpwood growth characteristics, and naval stores.

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Filmslides for Record Material

IN THE article "Are We Ready to Preserve Newspapers on Films," The Library Quarterly, April, 1935, Dr. A. F. Kuhlman, of the University of Chicago Libraries, presents an excellent discussion of the subject. This article is timely because of the widespread interest in the possibilities of filmslides, including sound reproduction, for both producing and reproducing records for library and other educational uses. The article embodies the opinions of librarians and others well qualified to answer the question, and based on their statements the following very complete summary of the present situation is quoted in part:

"Fortunately, the Carnegie Foundation has made a grant to enable the Bureau of Standards to begin the scientific study of the stability of the film. It is hoped that the Bureau will be able to render, within this year, an authoritative statement based upon its findings.

"Thus, to summarize, before we can say we are ready to preserve newspapers in film form, dependable and favorable answers must be found to a series of unsolved problems. First, the Bureau of Standards must settle the question of the life-expectancy of the film record. This presents an intricate problem of many variables. The Bureau must determine (1) the chemical and physical properties of the cellulose acetate film and of the emulsion and image produced upon it in filming records; (2) specifications for producing and processing the film to obtain the most usable and durable product; (3) the effect upon the film copy, while in use or storage, of various environmental conditions—temperature, humidity, light, human contact, etc.; and (4) specifications for storage and use. These points determined, it should become possible to predict, on the strength of verified data, the life-expectancy of the film if produced, processed, stored, and used under clearly specified conditions.

"A corollary of this study is the problem of discovering and producing fine-grained films and of processing them so as to secure sharp-cut reproductions to cope with extraordinary problems presented by old, oversized, stained pages of fine print. Another corollary study consists of determining the merits and limitations of various cameras now available. Two closely related problems calling for verified data concern the feasibility of making and employing miniature prints of newspapers, and the stability of sound recordings on wax, composition, and metal-alloy disks.

"Second, the determination of the merits of various types of projectors presents problems upon which libraries should have tested data from an impartial agency such as the Bureau of Standards. Eyestrain and the use of ineffective equipment should be prevented. It should not be left to individual libraries to discover by trial and error the merits or limitations of the projectors now on the market, or, because of the high prices of projectors, to improvise ill-adapted equipment.

"Thus, it would seem that the test to determine the feasibility of filming records is a crucial one. Its outcome, if favorable, may revolutionize the designing and construction of library buildings and equipment, vastly modify the interlibrary organization of the world, and have a profound effect upon the scholarship of the future. It should settle the momentous question of whether in film copy this generation will rediscover a practical medium through which the records of our present and past civilizations can be preserved."

Effect of pH Upon the Freeness of Chemical and Groundwood Pulps

E. C. LARY[1] and D. S. DAVIS[2]

THE effect of consistency and temperature upon the freeness of papermaking stocks is well known. [3, 4, 5, 6]. It is not generally realized, however, that hydrogen ion concentration, familiarly known as pH, has a marked influence upon freeness values.

In connection with another investigation the authors had occasion to make a preliminary study of the effect of pH upon the freeness of sulphite, soda, groundwood, and kraft pulps. It is the purpose of this brief paper to present the results of this cursory investigation, although the data are admittedly fragmentary, with the idea that others may be tempted to complete the study and to advance satisfactory explanations of the phenomena.

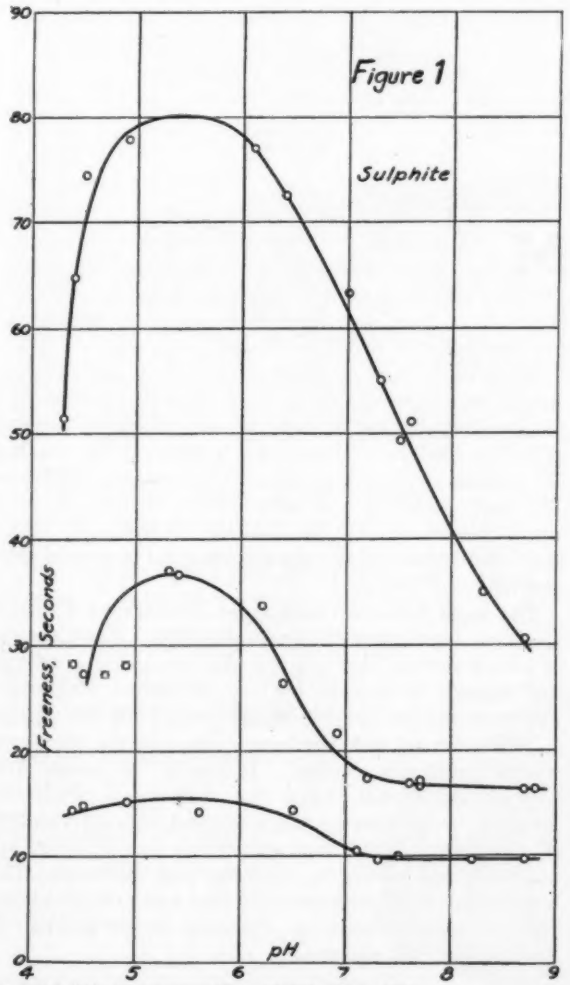
Methods

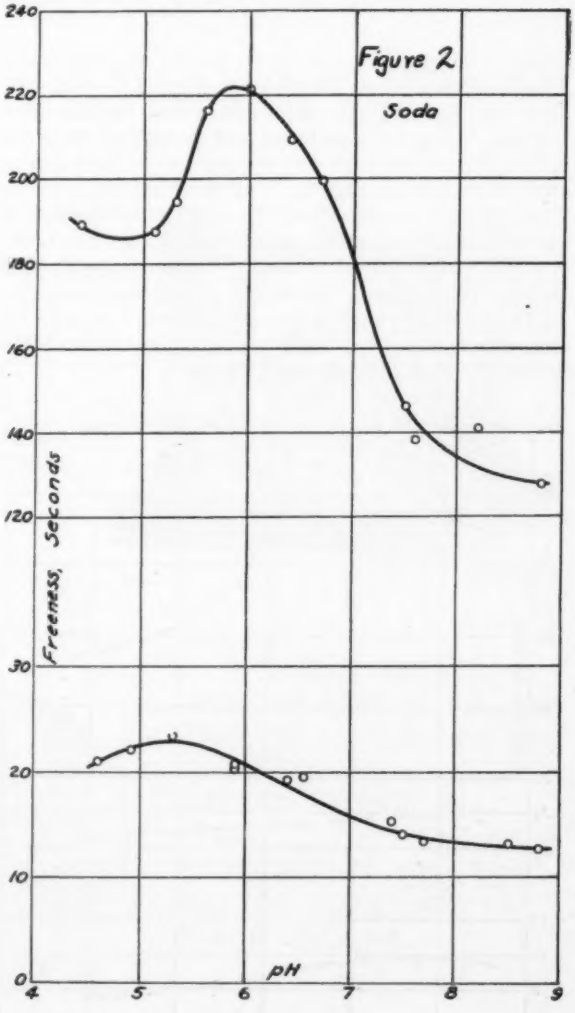
Stock Preparation. The stocks under consideration included untreated samples of each of the four pulps as well as "refined" portions of the sulphite, soda, and kraft pulps. Refining was accomplished in a laboratory refiner which accorded the pulp a treatment somewhat similar to jordaning.

Freeness Testing. All freeness tests were made with the Williams Precision Freeness tester, previously described[7] at 25 deg. C., and at sample weights close to the standard 3 grams of bone-dry pulp. All freeness values were expressed in seconds at 25 deg. C., and were corrected to the standard sample weight by means of previously developed conversion charts (4).

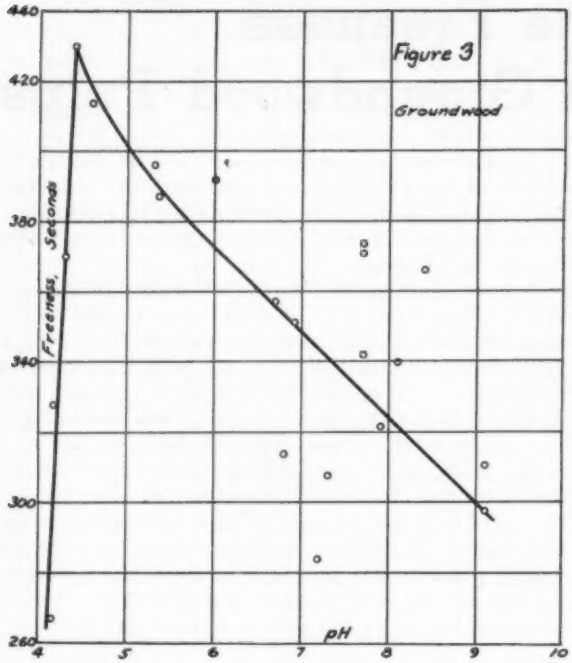
pH Tests. pH determinations were made with the La Motte Colorimetric Comparator.

Procedure. An amount of stock equivalent to approximately 3 grams of bone dry pulp was measured into a glass beaker from a master pulp suspension. Small amounts of 10 per cent potassium carbonate, 10 per cent alum, or tenth-normal hydrochloric acid were

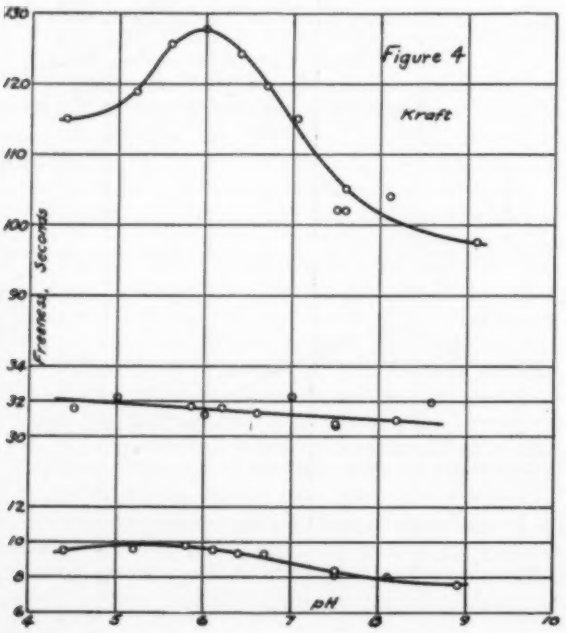




1. The Mead Corporation, Chillicothe, Ohio.
2. Dale S. Davis' Associates, Watertown, Mass.



added to bring the pH value to any desired point. The suspension was stirred and allowed to stand for five minutes. It was then transferred to the glass column of the freeness tester and diluted to the mark with sufficient warm or cold water to bring the temperature to exactly 25 deg. C. The time required for one liter of water to drain away from the pulp mat during the process of formation, or the freeness, was read from a stop-watch. The pulp mats so formed were pressed, dried, and weighed, the weight permitting correction of the freeness value to the standard at 3 grams. pH determinations were made on the clear white-water which drained through the mats.



Results

The results of these tests are presented in the accompanying plots. Inspection of Figures 1, 2, and 4 shows that the slower sulphite, soda, and kraft stocks are considerably more sensitive to changes in the hydrogen ion concentration than are the more free pulps. In the case of the sulphites, Figure 1, the freeness-pH curves pass through maxima at a pH value of about 5.4 while with soda and kraft, Figures 2 and 4, respectively, the maximum points occur less sharply but are between pH values of 5 and 6. The groundwood data are extremely erratic but it is clear that there is a rapid change in freeness between pH values of 4.0 and 4.4 and that there is a slower but distinct freeing effect as the pH values increase from 4.4 to 9.0.

In following the action of a mill or laboratory beater with the freeness tester it is usual to take the initial sample soon after the pulp is disintegrated and to withdraw remaining samples at frequent intervals until the beater is dropped. In view of the above data it is seen that no freeness sample should be taken after the addition of the alum which usually occurs near the end of the beating interval.

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7. *Ibid.*, *88*, No. 22, 173 (1929).

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Wet Motor Winding[1]

MANY motors are subjected to steam, dampness, and water under normal operating conditions. For such machines special insulating varnish and treatments have been developed that will help greatly to decrease failures due to dampness.

Motor or generator windings that have become damp should be completely dried out. This can be done by placing lampbanks, or strip or glow heaters, around or in the machine and covering it with canvas, leaving an opening at the top to permit the escape of moisture. The best results are obtained when there is a good circulation of air over the winding surfaces. If necessary, small ventilating fans may be used to provide the required circulation.

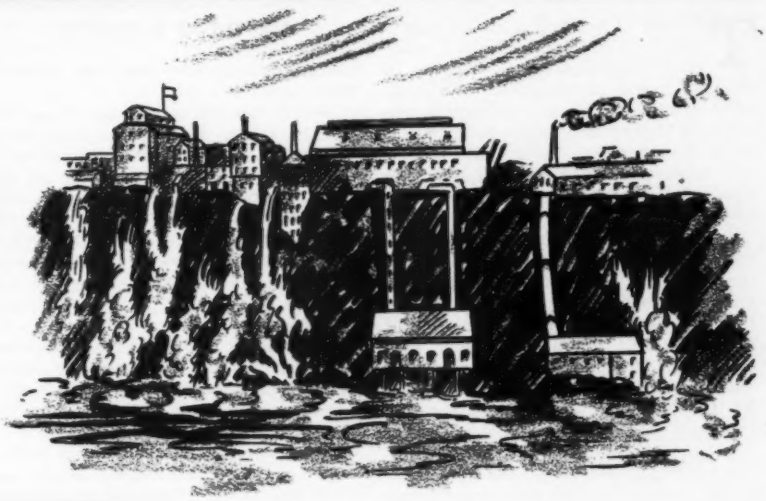
The most effective method of drying out a damp machine, particularly large high-voltage machines, is to pass a current through the winding, using a voltage low enough to be safe for the moistened insulation. For example, use 220 volts to dry out a 2,200-volt motor.

While drying out, the temperature of the windings should be closely checked. It should not exceed 100 degrees Centigrade, when the winding is dried externally, or 90 degrees when passing current through it. Insulation is the most vulnerable part of electrical machines and usually requires the most attention. The best insulation deteriorates with time and usage, and this process is accelerated by abnormal temperatures, vibration, dirt, oil, and so on.

[1](1) An excerpt from "For Motors, This Maintenance," by C. L. Keene, published in *Factory Management and Maintenance*, Vol. 93, No. 5.

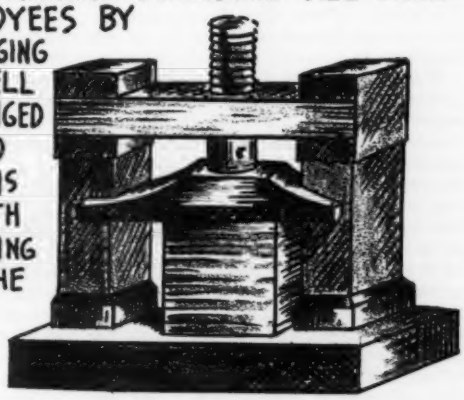
Paper Sketches ---

ALTHOUGH THE 2-100 H.P. ELECTRIC MOTORS PUT INTO OPERATION JULY 10, 1896 BY CLIFF PAPER CO., NIAGARA FALLS, N.Y., SEEM TO HAVE BEEN THE FIRST USED IN PAPER MAKING, THE INDUSTRY TODAY USES MORE THAN 50,000 MOTORS WITH A COMBINED RATED CAPACITY EXCEEDING 1,600,000 H.P.



"KILLING TWO BIRDS WITH ONE STONE" WAS WHAT NICHOLAS HASSELBAUGH OF PENNSYLVANIA ACCOMPLISHED WHEN HE ADDED MILLING STONES TO HIS 18TH CENTURY PAPER MILL EQUIPMENT AND SUPPLIED HIS NEIGHBORS WITH BOTH PAPER AND FLOUR.

TO SQUEEZE EXCESS WATER FROM A POST OF PAPER, OLDTIME PAPERMAKERS SUMMONED ALL MILL EMPLOYEES BY THE RINGING OF A BELL AND OBLIGED EACH TO LEND HIS STRENGTH IN SCREWING DOWN THE PRESS.



IN 1767, POTATOES WERE SO RARE IN HOLLAND THAT DR. JACOB CHRISTIAN SCHAFFER COULD NOT GATHER ENOUGH THAT YEAR TO CONCLUDE HIS EXPERIMENTS ON THE USE OF POTATOES IN PAPER MAKING.

Paper Grain . . . . . .

Its Importance in Book Production

VINCENT S. SMITH

THERE is nothing quite so aggravating to the printer with a sense of craftsmanship as marks of cheapness and carelessness in his finished product. This aggravation is pronounced particularly when these marks arise from matters beyond his control and especially when investigation discloses that the defects can be remedied without extra cost.

Some time ago, in pursuit of greater perfection, attention was focused upon the subject of book production in which operations a peculiar and persistent defect had been disclosed. It was found, after the full sized sheets had been printed, folded and bound, that a finished volume, when held lightly in the hand by the spine, frequently displayed a tendency to gape open and the edges of the pages showed a definite waviness.

An investigation into this phenomenon at first tended to turn attention towards the greater speed of modern book printing and binding in an effort to find the root of the difficulty, it being at once conceded that these might have an important bearing upon the subject. The solution, however, was thought to be found in the method of manufacturing the paper. From this conclusion, attention was turned to the study of the paper grain.

It must be understood that *grain* refers to the actual fibers of which the paper is composed. Frequently, in some minds, there is a little confusion on this term and the impression of the wire of the papermaking machine. It so happens that the machine direction, denoted by the diamond shaped marks of the machine wire, is also indicative of the way of the grain, but the grain and the wire mark are two entirely different subjects.

If the wire of a machine in operation could be stopped and the fibers held for a moment, it would be found that in advancing along the wire the proportion of water is gradually lessened and that of the fibers increased in ratio. Not only this but the majority of the fibers would be seen to be heading in the same direction just as logs of wood, when they are flowing down stream, have a tendency to travel on a line with the banks of the stream, providing there is no obstacle in the way. This action could not be allowed to persist in papermaking. Such fibers would be incapable of offering any real resistance to being pulled apart. To overcome this weakness, they are encouraged to entwine by giving the machine wire a sidewise shaking motion at right angles to the way the pulp is flowing.

Naturally this continuous shake has a considerable effect in disturbing the fibers, but it is never so great as to entirely overcome their tendency to flow parallel to one another. As a result, there will be a greater number of fibers running along the machine direction than across it.

Herein lies the root of the grain difficulty; and it is essential that some indication of the machine direction is given on the ream wrapper of all supplies of paper received by printers dealing in the production of books. It is well known that if there is any doubt concerning the machine direction that there are simple methods of determining this fact. The easiest method, perhaps, is to hold the sheet to the light and to note the impression of the machine wire. The acute angles of these tiny diamonds point in the machine direction. If these are not observable then two equal strips should be cut from the sheet, one along and one across, and if these are held up side by side one will tend to droop more than the other. The stiffer strip will denote the machine direction. A third method is to cut a small square from the corner of a sheet, first making a pencil mark on the square in order to show afterwards which way it had been cut. Then, if one side is slightly dampened and this side placed on a flat surface, the paper square will immediately curl. The two edges which are raised from the flattened surface will denote both the way of the grain and the machine direction.

Examination of the paper in any book that gapes open or with the pages showing a definite waviness will reveal that the grain of the paper runs across the page and not along the length. Consequently, the fibers at the fold when the full sized sheets are eventually folded to their final size, are broken instead of being slightly pulled apart. It will be readily understood that with the mass of fibers, which constitute the back fold, there is set up a definite resistance which results in the gaping volume.

Occasionally, it will be discovered that this fault applies only to certain volumes in the run while others are satisfactory. Here again there is a simple explanation. With the very wide machines used in modern papermaking, the reels are not always slit to the same width. For example, if the sheets required are 30" x 40", one may be cut the forty-inch way and one the thirty-inch. These sheets are intermixed in the reams or reamed up separately. Thus the printer will have one sheet or one ream, in two, cut across the machine direction. Only those sheets or reams will cause the difficulty, while the others will operate perfectly.

It must not be overlooked that other factors may enter into the difficulty. The aptitude of paper for picking up moisture is acknowledged. If the paper was too dry when it left the mill, a fairly large proportion of moisture might be picked up easily and readily in the press or binding room. In fact, insufficient care at the bindery or even the rate of the binding might affect it.

The subject of binding raises another aspect of the question. It has been observed that when moisture enters a sheet of paper there is a tendency for the fibers to expand in width. This expansion of the fibers in width will operate in the gluing of the back of the book, and, if the fibers run across the back, a definite puckering will ensue. On the other hand, if the fibers run down the page, the difficulty will not arise.

There is one sure method of circumventing the grain difficulty in bookwork and that is by stipulating the way the paper should be made on the machine when ordering it. If the final sheets are to be folded 8vo, then the wide way of the sheet must be made across the machine, and for 4vo work the short way.

The grain difficulty does not entirely rest with bookwork. Many other papers used for printing purposes should be watched for this defect. For example, coated papers which are to be folded after printing also should be folded the way of the grain. Otherwise they will have a tendency to crack too readily. The same thought applies to pulp boards and similar products which are frequently folded after printing.

The way of the grain, in coated and other grades, is being shown in the price lists of many of the British mills. Likewise, nearly all paper parcels issued by these mills have an arrow imprinted on the ream wrappers to indicate machine direction—a practice that is to be commended.

The author of this article is a resident of London, and his point of view naturally reflects the practices common in Great Britain. —*Editor's Note.*

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◆ Harnischfeger Appoints Daniels as General Sales Manager

Announcement is made by the Harnischfeger Corporation of Milwaukee of the appointment of Charles W. Daniels as general sales manager for the entire line of P&H contractors' equipment, industrial products, P&H-Hansen Arc Welders, hoists, brewery equipment, etc.

Mr. Daniels, who has been connected with Harnischfeger for many years in various capacities, was for several years in New York, but most recently in charge of the Corporation's Philadelphia office. He has already transferred to the home office in Milwaukee to assume active charge of the sales for the various manufacturing divisions. He is succeeded in Philadelphia by Mr. L. M. Stout, who has been appointed to fill the vacancy as District Manager for that territory.

Centrifugal Pulp Screen in Board Mill

E. J. TRIMBEY

THE widespread use of continuous beaters for working up old paper stock in board mills has caused consideration to be given to the value of utilizing a pulp mill type of centrifugal screen for intermediate screening. This consideration has revealed that the use of such a screen permits greatly increased capacity to be obtained from the same beater equipment, makes possible the saving of considerable power in jordaning, and retains more nearly the full strength of the recovered fibers as the removal of the unbeaten flakes by the screen reduces the amount of jordaning necessary.

The beater charge, in batch beating for working old papers or in repulping broke, must be circulated until practically all of the paper flakes have been broken up. For the same reason, when using continuous beaters, the rate of feeding must be reduced and the size of perforation through which the repulped fibers pass small enough so that comparatively few unbeaten flakes find their way to storage. In either case, more or less jordaning is required to brush out such flakes as may have come through with the consequent use of considerable power and the unnecessary cutting up of the fully defibered portion.

Many mills dilute the stock from the breaker beaters to riffle out foreign materials and then thicken by passing over deckers either with or without screening before deckering.

The customary type of rotary paper machine screen, with slotted plates, is not suitable for this work as its capacity is low when called upon to handle stock containing such large quantities of unbeaten flakes and foreign materials. Flat screens with comparatively coarse slots, therefore, have been generally used.

More attention, however, is now being given to the use of certain types of centrifugal screens, screens with round hole perforations, few internal parts and which operate with large clearances between the rotating members and the screen plates. Such centrifugal screens are well adapted for this work as they give large capacity per foot of floor space, good separation of fiber from the unbeaten flakes, and low maintenance cost.

Round hole plates are much better for removing paper flakes than slotted plates. A flake cannot easily get through a round hole plate if either dimension is greater than the diamenter of the hole. With slotted plates, however, many pieces work their way through edgewise. These flakes usually are well softened and are readily broken up. In fact, the amount of agitation which they receive in a centrifugal pulp screen is sufficient to disintegrate many of them.

For the cheaper grades of box board or for the filler sheet, the residue from the centrifugal screen can be returned to the breaker beater for further treatment; while for the liner sheet or for old magazine, etc., as used in the better grades where a thorough screening must be done, the rejects from the centrifugal screen must be cleaned up on an auxiliary flat screen. The accepted stock from this auxiliary screen, depending on the fineness of slot used and the quality desired, may go direct to the thickener or be rescreened.

The screened stock can be delivered to the thickener and the tailings to an auxiliary screen or back to the beater without pumping through the use of a pulp screen which elevates both the screened stock and tailings.

The installation of a screen of this type in mills already equipped to dilute and riffle the stock, is comparatively simple. All that is necessary is to place a dam in the riffle spout a few feet from its discharge end, locate the screen adjacent to it, have the screen draw its supply from ahead of the dam and discharge the screened stock back into the same spout beyond the dam or into the thickener vat.

The problem, even in mills not already equipped with riffle troughs and thickeners, is not as great as might be expected. Most every board mill has a spare cylinder which can be converted into a thickener of the "slusher" type without a couch roll at comparatively small cost. Using a centrifugal pulp screen which elevates its screened stock, the thickener vat can then be placed high enough with reference to the riffler so its return water will flow to the inlet end of the riffler by gravity.

The most important point to be kept in mind in the selection of a centrifugal pulp screen for this work is to choose one with rugged internal construction and large clearances so that minor accumulations of strings or rags will not cause damage.

◆ ◆

◆ Conservation History of New York Written

The first comprehensive history on conservation in the State of New York has been written as part of the celebration of the 50th anniversary of the establishment of the first Forest Commission and the Forest Preserve. This history is now in the hands of the printer and will come out under the authorship of Gurth Whipple of the New York State College of Forestry, Syracuse.

It is planned to have the publication for distribution sometime in August and, in any event, not later than the final observance of the anniversary which will be held at Lake Placid, September 12-14. The publication is being issued cooperatively by the Conservation Department and the College of Forestry.

In this history an effort has been made to trace the events of an eminently successful half century of conservation in the State from cause to effect. And thus as far as possible to present a connected story of development along the most important lines of administrative work in this branch of State Government. New York has led the nation in the rehabilitation of its forests, wild life and the protection of its watersheds. It is in many respects a romantic story of progress, fraught with exceedingly difficult problems many of which are unique.

This is to be observed particularly in Article VII—Section 7 of the Constitution which provides that the timber of the Forest Preserve shall remain forever wild forest land and provides that the trees shall not be cut or in any way destroyed. This provision in its essence has held since 1894 against strong attacks by the wood industries and professional foresters for the cutting and utilization of the forest growth on the Forest Preserve. The publication touches on all the major activities which have come under the Conservation Department since 1885 when the Forest Preserve was established, also the stirring early history which preceded and led up to the creation of State control of the forests, fish, game and waters of the State in order to save these resources for future generations.

◆ Joseph H. Slater

Joseph H. Slater, manager of the Escanaba Paper Company, Escanaba, Mich., passed away June 24 at Herkimer, N. Y., where he had been ill for several months. He was 68 years of age.

By a strange circumstance, Mr. Slater passed away in the town where he first entered the paper industry in the United States. He was born in Ireland, his father being in the service of the British army. The family came to Canada, where he received his schooling, and grew interested in the manufacture of paper. His first connection with a paper mill was with the Herkimer Paper Company, in Herkimer. After leaving there, he managed several mills for the International Paper Company, and later had charge of the Spanish River Pulp and Paper Mills at Espanola, Ontario. He had been manager of the mill at Escanaba since 1918.

Mr. Slater was a well known and active figure in the industry. He was a member both of T. A. P. P. I. and the Superintendents Association. He had also taken an active part in legislation opposing free importation of pulp.

He is survived by two brothers and two sisters.

◆ THE LEIPZIG TRADE FAIR will be held this fall from August 25th to 29th inclusive. It is assured that buyers from seventy-four countries will attend and that the newest art and industrial products of twenty-two great producing countries, including the United States, will be on exhibition. The historic Fair which has been held without interruption for 700 years is the largest as it is the oldest in industrial exchange in the world.

Industry's Gains of First Quarter Not Maintained

The information on this page is quoted from a survey of the paper industry recently published by DUN & BRADSTREET, INC.—*Editor's Note.*

WHILE there has been an improvement in the general paper trade thus far this year, in many divisions the gains are being narrowed, as compared with those set down for the first quarter, and the trend appears to be toward a slow but continuous retrenchment as the summer months approach. There are innumerable indications, however, that basically conditions in the industry are strengthening, with the price structure firm, new uses being devised constantly for its products, and better grades coming more into prominence, in keeping with the country's rising purchasing power.

Because of the adverse weather conditions during April and May, which restricted consumer buying in most parts of the country, both output and distribution for the five months of the current year failed to equal the percentage of gain estimated at the beginning of 1935. As the trend again has started upward, much of this slack may be taken in before the close of the third quarter, as wholesalers now are displaying more willingness to make commitments beyond immediate requirements. For some divisions of the trade the fall outlook is viewed as the brightest in several years.

In spite of the poor showing made by the newsprint division, tonnage output is ahead of the comparative 1934 figures, and distribution has exceeded that level by an even wider percentage. Profits, however, have fallen, to some extent, because of increased operating costs and keener sales competition. Exports of paper have expanded, the gains ranging from 9 per cent for wrapping paper to 46 per cent for paper bags, and 60 per cent for waterproof and greaseproof papers.

Mill Output Increased

In spite of the recession reported for some districts, production of paper thus far this year has been 5 to 10 per cent in excess of that turned out during the corresponding months of 1934, the volume increase representing tonnage, as price fluctuations have been narrow. Industrial expansion undoubtedly has played an important rôle in the widening distribution of paper, as manufacturers are turning more and more to paper for packing purposes, a more insistent call having developed particularly in the furniture, hardware, brewery, confectionery, and apparel trades.

The poorest showing was reported for the South, as many of the manufacturers there failed to equal their output figures of a year ago. In the New England states, on the other hand, mills were so well occupied on current orders that no supplies were left for stock, and employment was larger than in 1934. Increases in operating schedules practically were general in the Wisconsin pulp and paper mills, and both employment and pay rolls have shown successive monthly increases thus far this year.

The course of newsprint production in 1935 has not paralleled the steady upward trend followed during the first five months of 1934. After the total output of mills in the United States and Canada dropped to 251,110 tons in February, production was steadily higher in March, April and May. The total for the latter month, however, of 327,016 tons was smaller by 5,249 tons, or 1.5 per cent than the output of 332,265 tons in May, 1934. Total production for the first five months of 1935 was 1,437,096 tons, a drop of 0.68 per cent from the comparative 1934 output of 1,446,963 tons.

Trend of Sales Upward

Even though some of the gains of the first quarter were lost during April and May, wholesale distribution of paper for the elapsed five months of the current year ranged from 5 to 12 per cent larger than for the comparative period of 1934. Bonds, ledgers, uncoated book papers, and the cheaper grades of prints and wrapping paper headed the list of the best-selling items, with some of the wholesalers of fine paper reporting increases of 25 per cent.

The rising demand for all grades of building paper has lifted the volume 30 to 40 per cent above the average of the last five years. Increased expenditures for advertising have brought more orders from printers, and heavier consumer buying has enlarged sales of wrapping papers. General industrial improvement has benefited manufacturers of paper bags and containers.

In the early months of the year some stocking of paper occurred, chiefly because of fear of higher prices, which failed to develop, so that inventories are estimated at 5 to 8 per cent larger than in 1934. Collections are more satisfactory, the improvement over a year ago averaging 8 to 12 per cent, although most of the smaller printing establishments still are being sold mostly on a cash basis.

Prices Generally Steady

On practically all grades of paper, prices have held comparatively firm, continuing at about the level reached during the adjustments made in the summer of 1934, despite the advances recorded for a few items and the losses for others. Sulphite paper has become somewhat firmer, tissues are steady, and there is more strength noted in the quotations on coarse papers. On the other hand, kraft has turned easier, prices on solid ledger books have weakened, while paper stock, old papers, and mixed paper continue to drag at bottom levels.

The advance of $2.50 a ton in the price of newsprint for the first half of 1935, with another $2.50 to be added for the second half of the year, was rescinded in January, which left the quotation at $40 a ton, at which position it had been pegged since April, 1933, when it was reduced from $45 a ton. While there appears to be no likelihood of changes in the near future, should revisions be made these undoubtedly will be in an upward direction, in view of the decision of mills to maintain code hour and wage schedules.

Failures Starting to Rise

After dropping in 1934 to the smallest total since 1931, the trend of failures in the paper industry has been strongly upward thus far in the current year. For the entire twelve months of 1934 only 8 bankruptcies were recorded for manufacturers of paper, with the involved liabilities reduced to $892,529, whereas for the first five months of 1935 the number rose to 9 and the money loss to $1,012,529.

For wholesalers and retailers of paper the increase in failures was even more rapid during the first five months of 1935, as the number rose to 25, which compared with only 16 for the twelve months of 1934. Most of these bankrupt concerns were small, however, as despite the 5.6 per cent increase in the total that failed, the gain in the defaulted indebtedness was held to 3.7 per cent, having risen to $456,516 from $332,278 in 1934.

The peak year for failures was in 1932, when the number for the entire trade reached 44 and the involved liabilities $3,647,797. These totals were reduced by 40.9 per cent and 32.4 per cent, respectively, in 1933, and in 1934 the money loss was cut further by 50.3 per cent.

The complete insolvency record of the paper industry since 1927, including the first five months of 1935, as compiled by DUN & BRADSTREET, INC., shows:

Paper Manufacturers

Year	Number	Liabilities
1927	5	$2,017,000
1928	5	816,900
1929	10	1,929,200
1930	3	821,226
1931	1	800,000
1932	9	2,613,450
1933	10	1,944,189
1934	8	892,529
1935*	9	1,012,529

(*) January to May, inclusive.

◆ Two Types of Unit Coolers

An announcement of the Modine Manufacturing Co., Racine, Wis., states that their 1935 unit coolers for space cooling are made in two types and seven sizes.

One type of cooler, the cold water type, in general is identical in construction with the hot water type of Modine unit heater. It is fitted with a moisture eliminator assembly which collects the moisture condensed from the air during the cooling process. The eliminator may be removed from the unit in the fall. Deep well or tap water, noncorrosive brine, or water chilled by ice or mechanical means may be used as the cooling medium with this design of cooler.

The second type of cooler, having the same scope of application as the cold water type but having a specially constructed core, is designated as the direct expansion type. Such a cooler is used in conjunction with a compressor and employs methyl chloride, freon, or ammonia for the cooling medium. This unit, unlike the cold water type, is designed only for cooling and not for both cooling and heating.

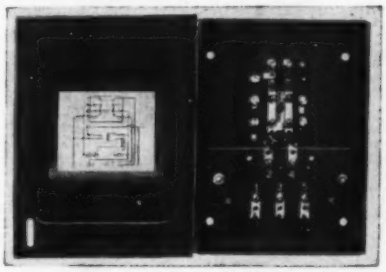
The direct expansion type unit cooler is available in three standard sizes. One size has an approximate ice melting equivalent of one ton when refrigerant temperature is 25 degrees and the entering air temperature 85 degrees. Under similar conditions, the second and third sizes have ice melting equivalents of two and three tons respectively.

◆ Colored Valve Wheels

A new type of valve wheel which is molded in five standard colors from plastic materials has been developed by Jenkins Bros., 80 White St., New York City, for use on their valves. The five standard colors are blue, red, black, green and gray. These colored wheels are offered unmarked and with five standard service markings molded in relief. Jenkins also offers to make up wheels of special color or with special markings. This development makes it possible to designate valves for steam, water, air or any other fluids and gases by distinctive colors.

◆ New Timing Relay

Edison Electrical Controls Division of Thomas A. Edison, Inc., West Orange, N. J., has designed a new timing relay for use on d.c. as well as a.c. current to meet the demand for an accurate, long life timer which will operate consistently under extreme conditions without need for constant servicing. It is composed essentially of an Edison



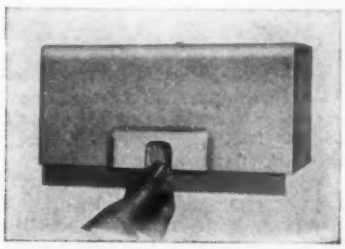
Type R-4 thermal relay, which operates a magnetic contactor. The thermal relay may be calibrated to operate with a delay of a few seconds or several minutes. This device, the nerve center of the assembly, is completely sealed in a glass tube from which all air has been exhausted.

The thermal relay is mounted with the magnetic contactor in a standard switch box, the magnetic contactor being provided with a spare set of contacts so that the unit may be used for sequence closing of two or more circuits. The assembly is wired to a readily accessible terminal board.

◆ Paper Dispensing Cabinet

A new roll paper dispensing cabinet has been announced by Paper Dispensers, Inc., Green Bay, Wis. The cabinet known as "Kwik-Grip" is designed to dispense all types of roll paper (whether perforated or unperforated), and is made for standard size tissue and towel; for wax roll 5 inches in diameter by 11 inches long; and in special sizes to order.

Standard colors are white, ivory and green but special colors may be had if desired.

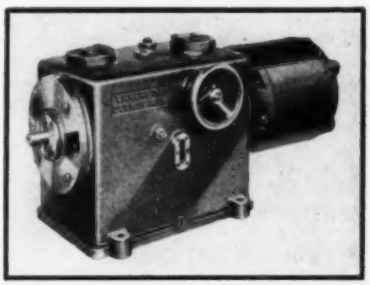


Inside of the cabinet there are no followers or mechanisms to hold the paper in position. The paper is held through the special design of the cabinet itself. Refilling is said to require only five seconds and it is suggested that paper can be gripped down to the last inch and withdrawn in any quantity as needed.

◆ Hydraulic Variable Speed Transmission

Vickers, Incorporated, 1400 Oakman Blvd., Detroit, Mich., has placed upon the market a compact and self-contained hydraulic variable speed transmission that is direct connected to a 1200 r. p. m. motor and which is designed to give any desired speed between 5 and 750 r. p. m. accurately, instantly and smoothly by simply turning a handwheel. Additional adjustments permit speeds up to 2500 r. p. m.

Both the constant speed end and the variable speed end of this transmission can be provided for rotation in either direction. This direction can be changed on the job without difficulty or additional parts. Likewise, a unit can be provided with a mechanism for instantaneous change of direction; and hydraulic, mechanical or electrical remote control may be substituted for the manual control.



This variable speed transmission is available at present in a size with a maximum output of 6 hp. continuous duty at 1000 lb. per sq. in. and 7½ hp. intermittent service at 1250 lb. per sq. in.

◆ Plasticized Wood

A process, known as TEMP-URD-WOOD, for treating and impregnating wood with a synthetic resin of the phenol and formaldehyde condensation type has been developed by the Pyratone Products Corporation, 309-319 St. Johns Court, Chicago. The wood to be treated with the synthetic resin is subjected first to vacuum conditions. Then it is submerged within a pressure vessel into the resin and a pressure of several atmospheres applied. The impregnated wood is thereupon subjected to a cure at 200 deg. Fahr. for about one hundred hours. A second application of the liquid resin, where desired, can be made and this application remains on the surface of the wood as a hard, smooth, transparent coating.

The coated product, according to the manufacturer, acquires marked chemical inertness and so great a resistance to water that six weeks are required for a doubly-processed wood to recover a normal moisture content (8 per cent) when submerged completely in water.

The manufacturer suggests the possibility of applying this treatment to insulation and building board, to molded paper products, and to any wood used in the industry in the construction of

machine parts or elsewhere that is subject to rather rapid replacement. Recommendations, of course, can not be made definitely without specific information regarding conditions to be met.

◆ Uniform Compression Coupling

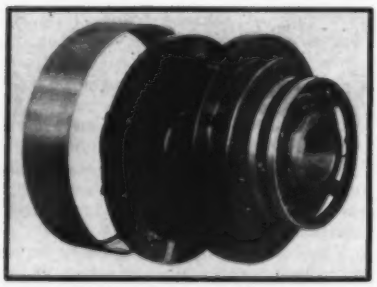
The Lovejoy Tool Works, 4947 West Lake St., Chicago, Ill., has developed and is now manufacturing a flexible coupling, designated as the L-R Type "IA" flexible coupling, in which convex jaw surfaces are utilized. These surfaces

exert a rolling pressure when bearing on a cushioning spider, each portion of the spider arm bearing an equal share of the load and the spider member having sufficient resilience, according to the manufacturer, to safeguard connected machines against shocks, overloads and misalignments. Three-part construction (two metal flanges and a one piece spider) makes assembly and installation quick and easy.

This design of coupling is made in standard sizes with bores from ¼ inch to 3 inches and for horsepower requirements from 1/12 to 200 at 1750 r. p. m.

◆ Positive Engagement Clutch

A new positive engagement clutch, which is driven through teeth in its outer periphery, has been developed recently by the Magnetic Manufacturing Co., Milwaukee, Wis. The clutch is released through spring pressure, a snappy, quick engagement and disengagement being obtainable. To prevent injury of the teeth, the engagement or disengagement should be made with the clutch standing still or rotating at very low speeds. The teeth are also shielded with a special outer shell if the clutch is to be installed in a dirty, dusty location. This shell prevents grit, dirt and

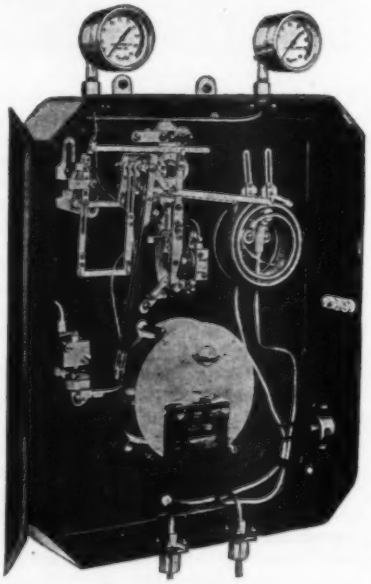


magnetic dust from interfering with the engagement. Under normal conditions of operation the shell is unnecessary.

In this design of clutch, which can be built in a number of different sizes, very high torques are developed within limited diameters, thus giving the unit application on high torque loads at high speeds.

◆ A Reset Controller

The new Taylor Reset controller, developed by the Taylor Instrument Companies, Rochester, N. Y., and designed to control temperature, pressure, rate of flow or liquid level in a predetermined relation to some other temperature, pressure rate of flow, or liquid level, employs one complete "Fulscope" control system and, in addition, an extra tube system, pressure spring or manometer, depending on the application. The "Fulscope" mechanism and the resetting mechanism are separate, yet so interconnected by linkage that any changes which occur in the resetting system are transferred to the "Fulscope" mechanism as control point adjustments. Both the adjusting and the controlled conditions are recorded.



The adjustable linkage of this new controller permits control point changes in a great variety of ratios between controlling and resetting systems. The maximum ratio value obtainable with the controller is 5 to 1 which means that the control point can be shifted a maximum of 5 units for each unit change in the resetting system.

Control is maintained by regulating the flow of air pressure to diaphragm valve in controlling medium line in response to changes in apparatus under control. A constant 25 lb. per sq. in. air pressure is specified for most efficient operation of the instrument.

The instrument chart is rotated by either an electrically driven clock movement or by a spring-driven clock; while the case is supplied for either face- or flush-mounting on panel boards. The case is of die-cast aluminum and is finished in instrument black as standard but white finish also can be supplied.

◆ New Protective Coating

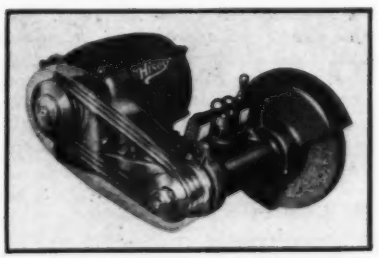
The Watson-Standard Co., 225 Galveston Ave., Pittsburgh, Pa., has announced a patented protective covering for application to metal, concrete, stone, masonry, wood and plaster. This covering, known as Plicote, contains resin composed principally of rubber hydrocarbon derived from crepe rubber and is obtainable in black, gray, red, green, white, tan, brown, orange, or aluminum color. Application of the covering is made by spraying, brushing, or dipping, it being stated to cover from 500 to 600 square feet to the gallon, depending on the surface. The manufacturer also claims that Plicote is effectively resistant to alkalis, acids, oils, and greases; that its impervious film, when dry, does not permit fume or liquid penetration; that intense cold does not affect it; and that it is resistant to heat deterioration and will stand temperatures up to 300 deg. Fahr. Likewise, it is stated to be odorless, tasteless, and non-toxic.

◆ Electric Roll Grinder

The Hisey-Wolf Machine Co., Cincinnati, Ohio, has announced a new electric roll grinder which is made in four sizes from 1 to 3 hp. and for use with 8-, 10-, and 12-inch diameter grinding wheels. The grinder, equipped with a constant speed motor and a V-belt drive, operates at practically the same speed under any load within its rated capacity.

In most instances, according to the manufacturer, rolls can be ground with this machine without removing them—the design of the grinder permitting mounting of the grinding head close to the roll and affording maximum wear of the grinding wheel. A dovetail slide with screw feed and handle affords rapid adjustment of the wheel to the center of the work. This adjustment, due to the angle of slide, does not affect the belt tension.

The grinding spindle, together with the motor, can be swung end for end so that grinding can be done either to the right or to the left of the machine. Direction of rotation of the wheel is reversible through the motor. Likewise, the grinder can be used horizontally, vertically or in any intermediate position.



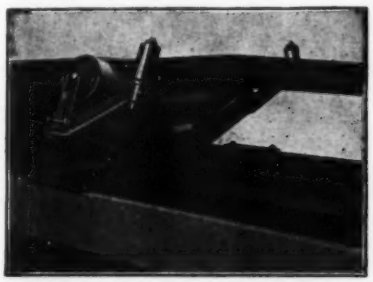
Both the motor and the grinding spindle are equipped with ball bearings, combination labyrinth and contact seals precluding any possibility of dust getting into the bearing chambers of the spindle. In addition, all oil, which is put into the machine, is filtered automatically.

Spindle speeds furnished as standard are as recommended by the grinding wheel manufacturers for each size of wheel.

◆ Self-Aligning Belt Conveyor Idler

The Link-Belt Company, Indianapolis, Ind., has announced a new and improved design of self-aligning idler for belt conveyors under the name, "Positive."

In this design of idler, the supporting frame for standard belt carrying rolls is provided with an arm on each end which extends parallel with and at the corresponding side of the belt and on which an actuating roll is mounted for the purpose of swiveling the idler frame when a crooked running belt crowds sidewise enough to engage it. The troughing idler frame in turn is supported by an anti-friction pivotal bear-



ing that is carried on a cross member of sub-frame bolted to the conveyor stringers.

Such an idler is placed at intervals between the stationary carrying idlers of a conveyor, and its operation is said not to be affected either by the speed of the conveyor belt or the load on it.

◆ Twenty-fourth Hammermill Conference

The twenty-fourth annual conference of Hammermill agents will be held in Erie on August 22 and 23, announcement was made this week by Hammermill Paper Company. Plans are for business sessions in the morning of both days, followed by golf and other recreational activities in the afternoon.

The Hammermill conventions have now been continuous for nearly a quarter of a century without a break for any reason. Owners and managers of paper wholesale houses from border to border and from coast to coast attend these meetings, and many of the representatives have not missed any of the meetings for more than twenty years. In this year's sessions the Hammermill organization will deal intensively with very active merchandising plans adapted to the fall and winter months and running into 1936.

◆ Buell Engineering Company

A newly formed company to be known as the Buell Engineering Company, Inc., 70 Pine Street, New York, N. Y., will build two outstanding classes of apparatus in America, according to a recent announcement.

The company will manufacture the "Buttner" Drying Systems of the rotary, turbo, and fine-film types, as well as the "Van Tongeren" System of Dust Extraction for fly-ash from stack discharge as well as for the collection of dust from chemical and cement plants. It was stated that burners and pulverizing sets for power and industrial grinding are also to be made.

Units will be manufactured by the Struthers-Wells-Titusville group which is associated with the new company. It is also linked with Buell Combustion Company, Ltd., of England, and thereby with New Consolidated Gold Fields.

◆ THE RETIREMENT of John G. Barry, senior vice president of the General Electric Company, after more than 45 years of service, and his election to an honorary vice-presidency, was announced by President Gerard Swope following the meeting of the board of directors held in New York on June 28. Mr. Barry, as active head of the apparatus sales organization, has for many years formulated and executed the company's policy and sales program in the apparatus field. He will maintain an office in Schenectady and will be available for consultation.

◆ L. H. Brendel Makes New Connection

Louis H. Brendel has joined the Consolidated Ashcroft Hancock Company, Bridgeport, Conn., as assistant sales manager of the Hancock Valve Division. He will assist M. S. Palmer, sales manager, in the promotion and sale of a new line of high quality valves.

For the past two years Mr. Brendel has been an account executive with the Sutherland-Abbott advertising agency, and prior to this he spent several years advertising and selling valves and industrial control equipment.

◆ F. C. HUYCK AND SONS, Albany, N. Y., has recently announced the election of David C. Jordan as a director of that company. Mr. Jordan, who is widely known in the paper industry, has been a sales representative of F. C. Huyck and Sons since 1909 and has represented his company in all parts of the country. He was made a director to fill the vacancy caused by the recent death of Mr. Watson A. Yule. Mr. Jordan will continue to act as sales representative for the company.

◆ Gair Takes Over Sherman Container Division

Gair Boston Containers, Inc., recently announced the acquisition of the Corrugated Container Division of Sherman Paper Products Corporation. The Medford Plant and Container Sales Office of Gair Boston Containers, Inc., of which Gordon W. Olson is vice-president and manager, will move to Newton Upper Falls, where the Sherman plant is located.

The Sherman Paper Products Corporation will concentrate on its line of paper specialties, including pan liners, corrugated, glassine and parchment for the food and other industries in adjacent buildings now part of their property.

◆ Steel-Forged Caster

The exclusive sales right to an all steel-forged caster, according to an announcement, has been obtained by The Metzgar Company, Inc., Grand Rapids, Mich. This caster is made in sizes for a number of different wheel diameters and faces. The yoke, steel-forged as a single unit, is anchored solidly to the top plate through a threaded stud, an upper and lower raceway for two sets of ball bearings being formed by the assembly, one between the top plate and yoke, and the other between the yoke and the inside head of the threaded stud. A machined baffle between the top plate and yoke prevents dirt and grit from entering the raceways.

Either a heavy-sectioned forged-steel wheel or a Metzgar floor-protective end-wood wheel may be used with the caster. The steel forged wheel may be equipped with either a Hyatt roller bearing or an Oilite bronze type bearing while the Metzgar wheel is supplied with a Hyatt bearing or a patented oil-less end-wood bearing. The axle machined to ⅝ inch in diameter from cold rolled steel, is shouldered at one end to give rigidity to the yoke and to prevent the axle turning.

◆ Robert T. Spencer

Robert T. Spencer, president of the Riegel Paper Corporation of New York, passed away at Guilford, Conn., June 25th, at the age of 82 years.

Mr. Spencer became president of the Riegel Paper Corporation in 1916, succeeding John S. Riegel, who passed on at that time. His connection with the paper industry dated back to 1884, when as a boy he began work as a clerk with L. Waterbury & Company of Brooklyn, manufacturers of cordage and paper. Later, the paper mill was separated from the cordage concern, and was known as the William Marshall Paper Company. Mr. Spencer became treasurer and manager. Upon the sale of the plant in 1899, Mr. Spencer joined the Riegel Paper Corporation, then known as the Warren Manufacturing Company. Up to the time of his retirement, several years ago, he occupied every official position and brought to the presidency an understanding of the company's affairs gained from many viewpoints.

Two daughters and one son survive.

Solving
the Peculiar and Personal Problems of the Industrial Advertiser

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.
537 So. Dearborn St. Chicago, Illinois

TO Advertising Managers, Sales Managers and Executives who sell products to Industrial America:

The 1935 convention of the National Industrial Advertisers Association will bring together in a single three day conference, the answers to many of the problems now confronting the manufacturer covering the advertising, merchandising and sale of industrial products.

The program, carefully planned and balanced by men who have devoted their careers to advertising and sales promotion, is practical, all embracing and highly instructive. It is advanced in the sense of being fully up-to-date but has due regard for established fundamentals.

This program has been created for the executive who is advertising minded and uses advertising as a useful tool, as well as for the specialist who is highly skilled in his profession. Every one who attends this conference conscientiously will carry ideas away which he can profitably employ in his business . . . It is recommended very seriously to all thinking executives.

The conference will be held in Pittsburgh, Pa. September 18th, 19th and 20th at the William Penn Hotel. It is suggested that advance reservations be made through the secretary of the Industrial Advertising Council, P.O. Box 1198, Pittsburgh, Pa., to insure satisfactory accommodations.

Yours sincerely

NATIONAL INDUSTRIAL ADVERTISERS ASSN.

General Chairman,
1935 Pittsburgh Conference

◆ E. N. Bechard Announces Southern Agency

E. N. Bechard announces that he is establishing an agency in the southern states, handling Eastwood-Nealley Corporation wires, Wm. E. Hooper & Sons Co. dryer felts, American Wringer Company rubber rolls and Ohio Knife Company cutter knives and chipper knives. For the time being, headquarters will be at 110 Oak Ridge Avenue, Nutley, N. J.; later headquarters will be established in Atlanta, Ga.

Mr. Bechard, familiarly known as "Gene," has been connected with Eastwood-Nealley Corporation for 11 years; the past four years having filled the position of sales manager.

◆ New Catalogues and Publications

Alemite Corporation, Chicago—The revised mid-year 1935 Alemite Powergun Equipment Catalogue has just been published. In 25 pages are presented, in natural colors, all equipment and accessories necessary for every kind of a complete, money-saving lubrication job. Full details and specifications are given, and all prices are quoted.

Bausch & Lomb Optical Co., Rochester, N. Y.—A new booklet entitled "Microscope Accessories," has just been received, and will be of great interest to the laboratory technician. The parts are covered in individual chapters, and the booklet is well illustrated. Numerous tables of data are included.

Chain Belt Company, Milwaukee—A new catalogue presents in pictorial form the various types of material handling equipment manufactured by this company, and its application in certain specific industries. The major industries, including pulp and paper, are represented. The catalogue is attractively laid out and printed in colors.

Combustion Engineering Co., Inc., New York—A bulletin has just been issued describing this company's VM boiler which embodies a compact efficient design for medium-size and small plants, particularly where headroom is limited. Blue print reproductions are included showing typical settings with underfeed chain and traveling grate stokers as well as with pulverized coal. Fusion welded drums are furnished.

Electric Controller & Mfg. Co., Cleveland—A new folder is devoted to a description of this company's Type "A" Safety Switches, which are claimed to be especially suited to industrial applications. Detailed information on this, or any of the company's other switches, will be furnished on request.

Electro Metallurgical Co., New York—Information of interest to fabricators and users of stainless steel is contained in a pamphlet entitled "Stainless Steels Treated with Columbium." The pamphlet shows how the addition of columbium to the sustenitic type of stainless steel results in the elimination of intergranular corrosion. Comprehensive data are given on the physical properties and corrosion-resistance of columbium-treated steels.

General Electric Co., Schenectady, N. Y.—"Improving Power-Factor for Profit" is the title of a new booklet featuring the G-E Pyranol Capacitors. Complete descriptive matter, data, tables, illustrations and curves are given.

Goodrich Co., B. F., Akron, O.—"Twelve Rules for Tire Health" is the subject of a four-page leaflet that has just been published. The material was written by K. D. Smith, technical superintendent of the company's tire division. Copies on request.

Glyco Products Co., Inc., Brooklyn, N. Y.—A new revised catalogue contains information and formulae on emulsions, polishes, abrasives, disinfectants, bronze lacquers, synthetic resins and waxes, adhesives, etching pastes, cutting and spraying oils, soluble oils, etc. There are also chemical tables that will undoubtedly interest the chemist and technical worker. Copies should be requested from the company, 949 Broadway, New York City.

Lawrence Machine and Pump Corp., Lawrence, Mass.—Bulletin 202 describes the Lawrence Standard Side Suction Pump. The construction of this type of pump, both belt driven and direct connected, and their various applications are well covered. There are cuts and tables showing the range of capacities and heads for the different sizes. Copies on request.

Linde Air Products Co., New York—"The Metallurgy of Oxy-Acetylene Welding of Steel" is a new booklet by J. H. Critchett, vice president of the Union Carbide and Carbon Research Laboratories, Inc. This is an exceptionally informative discussion of the physical and chemical principles involved in the oxy-acetylene welding of steel. The text is non-technical and the study covers physical changes such as expansion and contraction, metallurgical effects such as crystallization, heat-treatment and the effect of alloys, and the chemical reactions of steel with its surrounding materials. Anyone interested in the welding of steel will be interested in having a copy of this bulletin.

Link-Belt Company, Philadelphia—A new folder, No. 1414, covers a line of cost-reducing, time-saving portable belt conveyors for industrial plants, or any place where loose or baggy bulk materials are handled. The machines illustrated in the folder are fully described and embody a number of recent improvements in design and construction. Copies on request.

Louis Allis Co., Milwaukee, Wis.—A bulletin has just been published dealing with the special characteristics and containing other important information regarding electric motors for centrifugals. Copies on request.

W. H. Nicholson & Co., Wilkes-Barre, Pa.—The Nicholson welded steel float (chromium plated) and the welded stainless steel float are covered in a new folder just received. There are tables of weights and buoyancy of these floats, also list prices. In writing ask for Bulletin No. 635.

Timken Roller Bearing Co., Canton, O.—The third edition of the Timken Engineering Journal has been issued recently. This revised edition of the publication, containing 260 8½" x 11" pages of loose-leaf material bound in a heavy three-ring binder with stiff cover, describes the various types of Timken bearings, as well as supplies technical data on ratings, load calculations, bearing selection and other information relating to mounting, use and maintenance of Timken bearings. A copy of the publication will be furnished without cost by The Timken Roller Bearing Company to any engineer, executive, designer or librarian who requests it upon company stationery and gives individual title or connection.

U. S. Stoneware Co., New York City—A new bulletin, No. 801, contains a comprehensive treatment of the subject of Quick-Setting, Acid-Proof Cements for acid-proof tanks, acid-proof towers, and acid-proof floor construction. Copies on request.

Whiting Corporation, Harvey, Ill.—A new pamphlet, just issued, is devoted to this company's electric cranes as especially applied to the handling of paper and pulp. The uses of this equipment are graphically told with a number of illustrations, and copies will be mailed to interested persons.

BOOKS

American Paper and Pulp Ass'n—The revised issue of official rules for weighing, sampling and testing wood pulp for moisture and trade practices for approved pulp testing chemists issued by the Joint Committee on Approved Pulp Testing Chemists, is now ready for distribution. This phamplet may be obtained from the offices of the Association, 122 East 42nd Street, New York City, for 50 cents per copy.

Cost Accounting Principles and Practice by James L. Dohr, Associate Professor of Accounting, Columbia University; Howell A. Inghram, Instructor in Accounting, Columbia University, and Andrew L. Love of the accounting staff of the School of Business, Columbia University, is one of the new books, revised edition, published by The Ronald Press Company, 15 East 26th Street, New York City. This book of over 600 pages is divided into four major parts, namely: Introduction to Cost Accounting, Cost Accounting in the Manufacturing Enterprise, Special Cost Problems in the Manufacturing Enterprise, and Cost Accounting Systems. Within these four sections of the book are thirty-three chapters covering such subjects as classifications and analysis of expenditures; unit costs; financial statements by the inventory method; purposes, relationships and goal of cost accounting; development of the ledger; factory service and subsidiary accounts; material and labor; goods in process, finished goods, and shipment; separate factory accounts; acquisition and use of factory service capacity; problems of manufacturing risks, by-products and joint products; administrative control; standard costs; design and installation of cost accounting systems; product classification; estimating cost system; complete cost system and associative cost accounting. The principles as set forth are fundamental and show the relation of cost accounting to efficient management. The book is priced at $4.00 per copy by the publishers.

U. S. Department of Commerce, Bureau of Standards—Research Paper RP763 has been published in pamphlet form. This reprint is part of the Journal of Research of the National Bureau of Standards, Vol. 14, February, 1935, and is entitled "Impact and Static Tensile Properties of Boltes," by Herbert L. Whittemore, George W. Nusbaum and Edgar O. Seaquist. Price 10 cents per copy. Another research paper, RP779 of the same volume, April, 1935, "Relation of Ink to the Preservation of Written Records," by Elmer W. Zimmerman, Charles G. Weber and Arthur E. Kimberly, is also available for 5 cents per copy. Orders should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Wood-Lumber & Timber, Volume 1 of the Chandler Cyclopedia, is now ready for distribution in a new, popular, cloth binding. This book, compiled by Phillips A. Hayward, Technical Consultant of the United States Department of Commerce, is a work of over 500 pages, the page size being approximately 7¾ x 10¾ inches. It is a volume that has been developed to assist consumers and fabricators of wood and allied products in the purchasing and use of lumber. Data has been gleaned from a wide variety of sources. Among the major divisions of the book are extensive individual sections on wood structure, lumber—its manufacture and utilization, identification of wood, industrial uses for woods, hardwoods, and softwoods as well as a number of miscellaneous tables, a tabulation of standard lumber abbreviations, thirty-five plates and sixty-two additional illustrations. Numerous reading references also are included so that they may be consulted for additional information. Little information is given on the woods for papermaking, but so extensive is the general theme of the publication that it should prove valuable as a reference to chemist and engineer alike as well as to others who might have anything to do with wood in any technologic sense. The book is being distributed by The Chemical Publishing Co. of N. Y., Inc., 175 Fifth Avenue, New York City.

Opportunity Section

The *original* motor driven bursting strength TESTER

Quick, smooth and quiet action.

The preference for modern design and correct results.

E. J. CADY & COMPANY
549 W. Washington Boulevard, Chicago, Ill.

THE TRADE-MARK OF GOOD FELTS

The Waterbury Felt Co.
SKANEATELES FALLS, N. Y.

PULP MILL MACH'Y ◆ FINISHING ROOM MACH'Y ◆ FRICTION CLUTCHES ◆

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STICKLE AUTOMATIC STEAM CONTROLS
DRAINAGE SYSTEMS FOR DRYERS AND HEATING SYSTEMS
CONDENSATION ECONOMIZERS FOR HEATING AIR
DEAERATING FEED WATER HEATERS, REDUCING VALVES
STEAM TRAPS, OIL AND STEAM SEPARATORS

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WATERTOWN, N.Y.

STEBBINS ENGINEERING & MFG. CO.

MORRIS CENTRIFUGAL PUMPS

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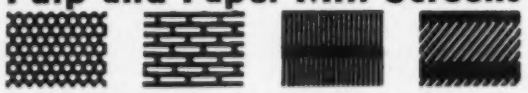
MORRIS MACHINE WORKS, Baldwinsville, N. Y.

Pulp and Paper Mill Screens



of STAINLESS STEEL—COPPER—BRONZE—MONEL—CHEMICAL RESISTING ALLOYS

Perforations that are accurate in size and alignment
ANY METAL ·· ANY PERFORATION

The Harrington & King PERFORATING Co.

5654 Fillmore St., Chicago, Ill. ◆ 114 Liberty St., New York, N.Y.

For The Papermaker's Library

Papermaking Research Around the World, by Dr. Louis E. Wise.

Identification and Microscopy of Woods and Wood Fibers Used in the Manufacture of Pulp, by Ellwood S. Harrar and J. Elton Lodewick.

Lessons in Paper Making, Part 1, by Harry Williamson.

Lessons in Paper Making, Part 2, by Harry Williamson.

Practical Helps for the Mill Man.

Each one of these publications contains a wealth of information, and they are priced at only fifty cents per copy prepaid.

THE PAPER INDUSTRY
333 North Michigan Avenue
CHICAGO ILLINOIS

◆ Dr. Langmuir Elected to Foreign Membership in Royal Society

Dr. Irving Langmuir, associate director of the General Electric Research Laboratory at Schenectady, has been elected to foreign membership in the Royal Society, England. Foreign membership, considered one of the highest honors that can be bestowed by British scientists on fellow workers in other countries, is limited to fifty persons throughout the world.

Dr. Langmuir, Nobel prize winner, is one of eight Americans now foreign members of the Royal Society, and is the only American industrial scientist so honored.

◆ Consumption of Pulpwood and Production of Wood Pulp

The consumption of pulpwood and the production of wood pulp in the United States increased 3.6 per cent and 4.6 per cent, respectively, in 1934 as compared with 1933, according to a preliminary report released by Director William L. Austin, Bureau of the Census, Department of Commerce.

All figures for 1934, as given in the tables below, are preliminary and subject to revision.

Table 1.—Pulpwood Consumption by Kind of Wood for the United States: 1934 and 1933

Kind of wood	1934 Cords	1933 Cords
Total	6,796,659	6,561,674
Spruce:		
Domestic	1,535,299	1,495,061
Imported	638,127	576,000
Yellow pine, Southern	1,459,171	1,560,414
Hemlock, domestic and imported	1,428,116	1,112,556
Balsam fir:		
Domestic	290,385	261,466
Imported	86,647	41,465
Poplar:		
Domestic	241,001	333,438
Imported	92,271	
Jack pine	218,116	178,974
White fir	98,166	154,847
Beech, birch, and maple	83,996	93,032
Tamarack (larch)	12,267	21,844
Yellow poplar	73,492	252,436
Other woods*	303,161	
Slabs and mill waste	236,444	480,141

* Domestic chestnut, cottonwood, Douglas fir, gum, white pine, willow, and miscellaneous hardwoods not reported separately for both years. In addition, red fir for 1934; domestic basswood, yellow poplar, and imported pine for 1933.

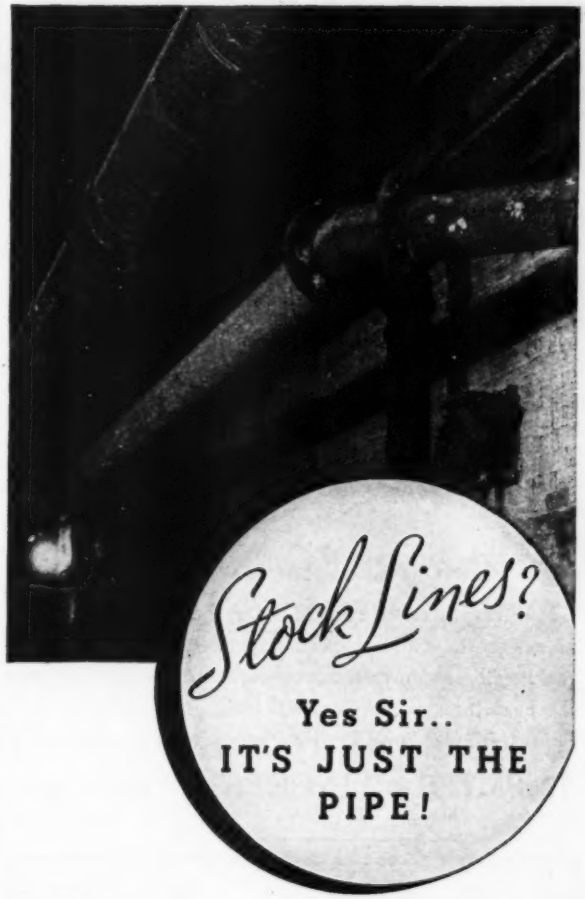
Table 2.—Wood-Pulp Production by Process for the United States: 1934 and 1933

Process	1934 Tons of 2,000 lbs.	1933 Tons of 2,000 lbs.
Aggregate	4,490,859	4,293,344
Mechanical, total	1,296,535	1,197,553
Not steamed	1,202,292	1,079,066
Steamed	94,243	118,487
Sulphite, total	1,475,795	1,306,575
Unbleached	661,514	580,102
Bleached	814,281	726,473
Sulphate, total	1,262,734	1,259,351
Unbleached	1,167,257	1,195,938
Bleached	95,477	63,413
Soda, total*	420,201	495,930
Unbleached*	92,929	149,192
Bleached	327,272	346,738
Screenings, total	35,594	33,935
Mechanical	1,669	4,243
Chemical	33,925	29,692

* Includes, for both years, data for semichemical pulp, and in addition, for 1933, data for a small quantity of pulp not covered by items specified; included here to avoid disclosing production of individual establishments.

Table 3.—Pulpwood Consumption and Wood-Pulp Production by States: 1934

Statistics are given for all States for which separate figures can be published without disclosing, exactly or approximately



HERE'S a stock line in an Indiana paper mill. Hundreds of feet of 8-inch diameter Armco Spiral Welded Pipe—and its owners say it's the finest pipe they ever used for the purpose. Why do they like it? That's easily answered . . . . Armco Spiral Welded Pipe is strong, durable, flexible, and exceptionally adaptable. It is easily handled. Complicated assemblies are readily installed even in close quarters. You can use any standard type connections, and you can get special fittings for any job. Add to these features high flow capacity and optional coatings, and you have the slickest pipe that ever went into a paper or pulp mill.

Ordering is simplicity itself. Just mail your specifications and Armco Spiral Welded Pipe will be delivered *when* you want it and *how* you want it! The address is just below.

THE AMERICAN ROLLING MILL COMPANY
PIPE SALES DIVISION • MIDDLETOWN, OHIO

ARMCO SPIRAL WELDED PIPE
"Tailor Made for Paper Mills"

HARDY S. FERGUSON & COMPANY

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Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of { PULP AND PAPER MILLS AND OTHER INDUSTRIAL PLANTS; STEAM AND HYDRO-ELECTRIC POWER PLANTS; DAMS AND OTHER HYDRAULIC STRUCTURES

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NEW WET MACHINE?

S & W engineers are experienced in the design of wet machines for standard and special papers. S & W machines are making binders' board, leather board, insulating board, matrix board, press board, etc.—and under greatly varying conditions. All plans held in strict confidence. Consult S & W.

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CHEMIPULP PROCESS, INC.

CHEMICAL PULP MILL ENGINEERS

CHEMICAL PULPING PROCESSES, OPERATING SURVEYS
APPRAISALS ESTIMATES

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VEST POCKET POWER PLANTS

Small space occupied, any capacity, low over-all operating costs, high and extreme efficiencies, reliability, low initial investment.
Complete power plants to meet any operating conditions of Pulp and Paper mills or other Industrial service. Engineering and Construction.
Satisfactory Services Always Guaranteed.

FERGUSON ENGINEERS
Power Specialists
Monadnock Bldg., Chicago

Shall We Mark Time or March?

There will never be a law against making the best product at the lowest cost. But there is a law, which Congress did not pass, to accomplish that.

The Law reads: Direct your men how to do their work, how to measure their work, before they start, not afterward. Raise the level of paper making skill. Get work thoughtfully done. Intensify your interest and theirs in exact methods of doing work, in good work well done.

The combined skills of your organization form the one asset no depression, no political power, can rob you of. Your business can build it without spending money. Always vital, now also timely.

If you ask how, we submit it in detail for you. No one is obligated. Why not get it?

ARTHUR B. GREEN

249 Harris Avenue Needham, Mass.

The Original **LONGCRIMP FOURDRINIER WIRES**

Were made by this Company in 1922. Their outstanding service is known from coast to coast.

Our Modified Longcrimp is the latest improvement in that type of wires. It has the extra life of the original Longcrimp and can be used for light weight paper.

The Lindsay Wire Weaving Co.
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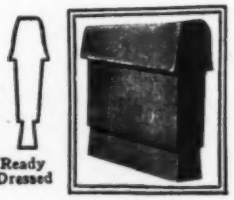
"READY DRESSED" MILL COGS

LABOR SAVING—TIME SAVING

THE MOST ECONOMICAL FILLINGTHAT CAN BE PUT IN A MORTISE WHEEL



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Blank Head

WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "O" WHICH IS FREE

QUICK SERVICE ON ALL SIZES

THE N. P. BOWSHER CO., So. Bend, Ind.

any data for individual establishments. The establishments in certain of the "Other States," however, consumed larger quantities of wood and produced larger quantities of pulp than those in some of the States shown separately.

State	Wood consumed	Pulp produced
	Cords	Tons of 2,000 lbs.
United States	6,796,659	4,490,859
Louisiana	519,884	339,602
Maine	1,081,988	833,107
Massachusetts	15,773	9,479
Michigan	267,808	188,980
Minnesota	212,940	137,096
New York	465,916	373,978
Oregon	322,287	240,167
Pennsylvania	228,520	127,541
Vermont	12,749	14,040
Virginia	381,668	235,221
Washington	1,203,518	709,380
Wisconsin	824,525	520,215
Other States*	1,259,083	762,053

* Alabama, Arkansas, Florida, Maryland, Mississippi, New Hampshire, North Carolina, Ohio, South Carolina, Tennessee, and West Virginia.

◆ New Paper Projects for Australia

An expenditure of £1,000,000 in establishing a paper industry in Australia is contemplated within the next two years, according to a recent report from Trade Commissioner E. C. Squire, Sydney. Press announcements state that the new projects contemplates the manufacture of fine printing and writing papers and pulp, utilizing the Australian eucalyptus as a raw material. Amalgamated Zinc (De Bavays) Ltd., through the Tasmanian Paper Proprietory, Ltd., and Australian Paper and Pulp, through Australian Paper Manufacturers, Ltd., are very largely interested in this enterprise.

The third party is a group (formerly non-newspaper members of Paper Makers, Ltd.) who have rights to property and timber interests at and near Burnie, Tasmania. The whole of the capital required will be subscribed privately. It is considered probable, however, that both Amalgamated Zinc and Australian Paper will themselves make public issues of debentures or shares later in order to provide the necessary capital for financing the projects. Three sites are under consideration as the location of the mill, namely, at Eden, New South Wales; Kermandie, Southern Tasmania; and Burnie, Northwestern Tasmania. The manufacture of newsprint paper is not contemplated in the present plants.

◆ Import Committee Active in Test Cases

In addition to the important test case involving the dutiability of paper outside the recognized definition of standard newsprint recently tried in New York, other cases involving various related problems are scheduled for trial at other ports in the near future, in which the Import Committee of the American Paper Industry will represent the domestic interests.

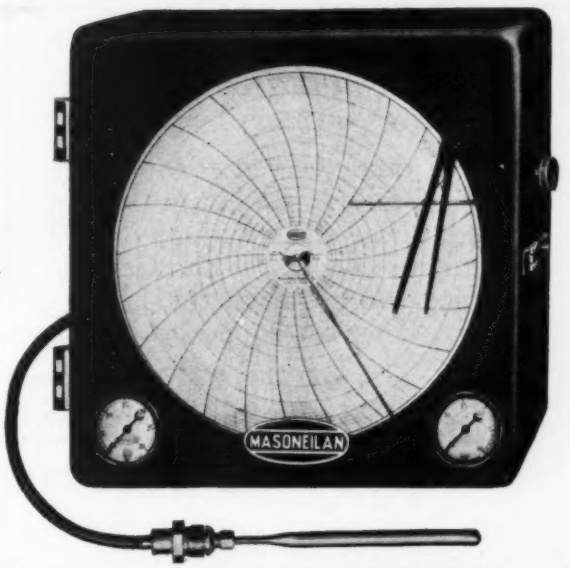
At Seattle there is before the Customs Court a series of cases involving canary newsprint in rolls used by a newspaper, and various shipments of colored poster paper in sheets. All of this paper was classified for duty by the Customs officials, but the importers have protested to the Courts that they are standard newsprint duty free.

At Los Angeles there are a series of importations before the court, involving not only colored poster paper in sheets, but also white paper with 10 per cent ash, and 40 per cent sulphite which the importer claims is duty free as standard newsprint.

The Secretary of the Treasury has ruled that Swedish M. G. Sulphite Wrapping paper is not being dumped. The ruling is the same as that previously made as to Swedish M. G. Kraft despite the fact that the highest Customs Court had previously ruled that the paper was undervalued about 1 per cent per pound. No reason for the ruling is given, but it may be assumed that it was to pave the way for the Swedish reciprocal trade agreement published shortly thereafter in which the United States cut the duty on Swedish wrapping paper.

The importers of bristol board have appealed to the United

ANNOUNCING



The No. 3700 RECORDING Temperature CONTROLLER

Here is a reliable instrument (at moderate cost) that permits you to have temperature control at those process points where cost has previously prevented equipment installation.

Put these new 3700's to work in your plant—they will keep "freeness" uniform in stock tanks, they will hold the temperature of causticizing tanks or size baths at just the right point for best results, or they will provide automatic temperature control for a score of other applications.

The No. 3700 Instrument is air operated, has an adjustable throttling range and is equipped with the exclusive Fulcro-Compensator that provides semi-floating control within exceptionally close limits. This controller is simple in design and easy to adjust or convert. Its many features are described and illustrated in Bulletin No. 2700-C. Send today for your copy.

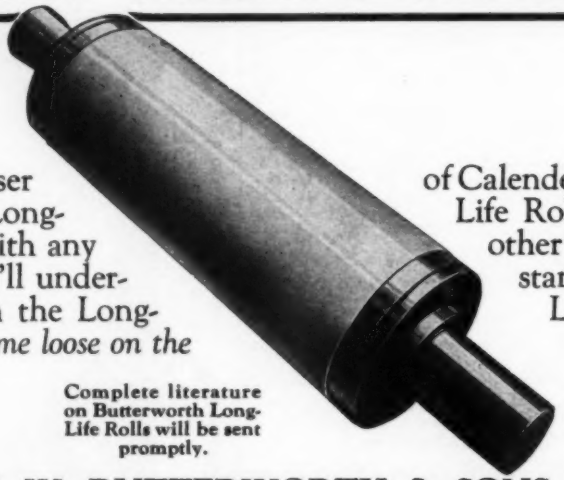
No. 3500 INDICATING TEMPERATURE CONTROLLER

This instrument is a companion controller to the 3700. It provides accurate temperature control, has a fixed throttling range, **indicates** but makes no chart record of the temperature. Fully described in Bulletin No. 2500-C. Write for your copy today.

MASON-NEILAN
REGULATOR COMPANY
1190 Adams Street, Boston, Mass.

YOU CAN BE SURE OF MASON-NEILAN PRODUCTS

Have you made this test?



WE urge every user of Calender Rolls to put a Butterworth Long-Life Roll, new or refilled, in the stack with any other rolls and time them all. Then you'll understand why the Long-Life Rolls. service you get from the Long-*They never come loose on the shaft.*

Complete literature on Butterworth Long-Life Rolls will be sent promptly.

H. W. BUTTERWORTH & SONS CO.
Established 1820
PLANTS at PHILADELPHIA and BETHAYRES, PA.

New England Office:	*Southern Office:*	*In Canada:*
TURKS HEAD BUILDING	JOHNSTON BUILDING	W. J. WESTAWAY CO.
Providence, R. I.	Charlotte, N. C.	Hamilton, Ontario

• BUTTERWORTH *Calender* ROLLS •

POOLE
Flexible Couplings

The Poole flexible coupling combines great mechanical strength with an unusual capacity for adapting itself to ordinary shaft misalignments. It has no springs—rubber—pins—bushings—die castings or any flexing materials that require frequent replacement.

Using strong specially treated steel forgings, long wearing gears in constant bath of oil, this coupling eliminates your coupling troubles.

Oil Tight—Dust Proof—Free End Float—Fully Lubricated
Send for a copy of our Flexible Coupling Handbook

Poole Foundry & Machine Co.
Baltimore, Maryland

1864 *The Qualifications of* 1935

EXCELSIOR FELTS

are embodied in their name

Elimination of felt marks
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States Court of Customs and Patent Appeals from the adverse decision rendered in United States Customs Court in April. The importers are contending that this merchandise is properly dutiable at rates other than the rate of 3 cents per pound and 15 per cent provided for bristol board, claiming it is either paperboard at 10 per cent or coated board at 30 per cent. The Import Committee is assisting the Government in conducting the appeal, in an effort to have the dutiability of such merchandise finally decided at the rate of 3 cents per pound and 15 per cent.

Cases abandoned by importers include four cases involving importations at New York of black print photographic paper claimed to be dutiable as basic photographic paper abandoned as result of test case deciding such paper to be dutiable at higher rate.

◆ Sustained Timber Crop Grown on Big Forest

Can a forest be made to produce timber permanently and at the same time repeated crops of timber be removed from the area? Owners of forests have been told by foresters that this could be done. Forestry is so young in this country that it has been rare to find a forested area so treated on a scale large enough to prove the truth of this oft repeated statement. But a convincing demonstration of it is now in progress, says the New York State College of Forestry at Syracuse University.

Recent studies have disclosed an outstanding example of sustained forest production over a large area which was logged under forestry practice 36 years ago and which brought fortunes to the owner and the contractor who carried on the logging operations. This is the Whitney Preserve in the Adirondacks composed of approximately 95,000 acres. The results obtained by recent studies carried on by George S. Meagher and Professor A. B. Recknagel of Cornell University deserve wider publicity than they have yet had. Their report shows that in 1898 the United States Division of Forestry under the direct supervision of Dean Henry S. Graves, now head of the School of Forestry at Yale, laid out a plan for logging the Whitney Preserve. Only the spruce and pine were cut, leaving the fir, the hemlock, the hardwoods and all of the spruces nine inches in diameter and below.

It was predicted by the foresters at that time that if the forest was logged according to this plan another crop as large as the one taken could be cut in 36 years. The second cut was initiated in the summer of 1934 and the spruce, which is being removed now, shows a yield approximately as large as that which was taken from the forest originally. Moreover, in some parts of the forest the acreage growth indicated that cutting could be done every 23 years.

This is an example of the application of forestry in the State of New York to a large woodland which proves what professional foresters have claimed, namely, that a forest may be lumbered indefinitely if done in accordance with the principles of forestry.

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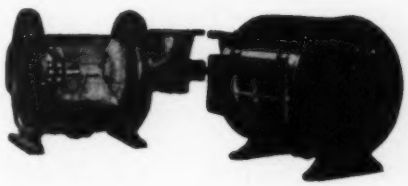

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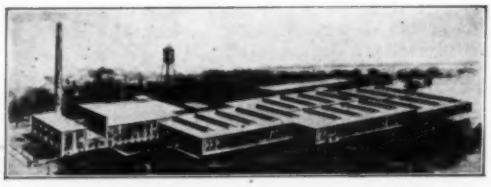

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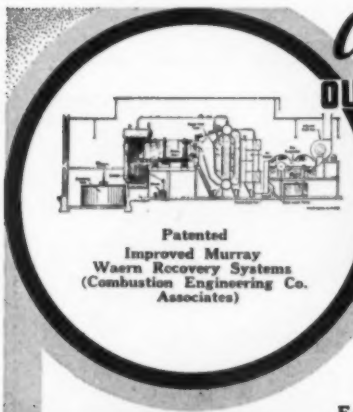

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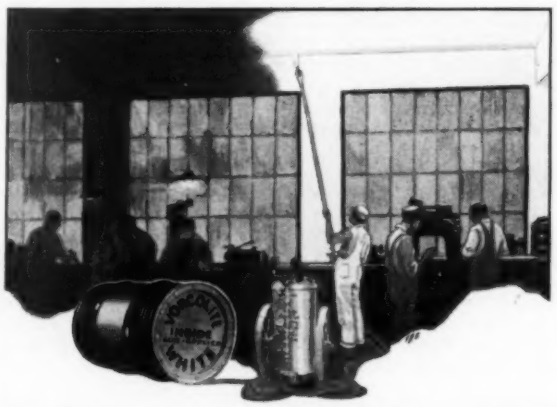

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13 Mills Still Compete

PERFECT SCORES
Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A			
GROUP B	St. Croix Paper Co.	Woodland	Maine
GROUP C			
GROUP D	Kimberly-Clark Corp.	Lakeview	Neenah, Wis.
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	U. S. Envelope Co.	Morgan Paper Co. Div.	Lititz, Pa.
	International Paper Co.	Livermore	Chisholm, Maine
	Spaulding Fibre Co., Inc.	New Mill Plant	Milton, N. H.
	International Paper Co.	Riley	Maine
	Mead Paperboard Co.	Rockport	Indiana

Division II—Remanufacturing

Container Corp. of America	Natick	Massachusetts
Texas Corrugated Box Co.	Dallas	Texas
Southern Container Co.	Houston	Texas
U. S. Gypsum Co.	Genoa	Ohio
Bemis Bros. Bag Co.	East Pepperell	Massachusetts

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-108	1	10	4.512
	P- 64	2	8	5.116
	P- 18	3	10	5.603
	P- 30	4	8	5.811
	P- 27	5	18	7.466
	P- 62	6	14	7.715
	P- 23	7	9	7.796
	P- 19	8	12	9.292
	P- 31	9	15	9.940
	P- 67	10	21	10.331
	P- 12	11	12	10.334
	P- 13	12	17	10.479
	P- 69	13	16	10.615
	P- 44	14	16	11.577
	P-114	15	19	12.667
	P- 1	16	26	13.373
	P- 95	17	17	14.352
	P-101	18	18	14.936
	P-102	19	36	19.494
	P- 28	20	79	19.868
	P- 2	21	26	21.377
	P- 78	22	28	21.919
	P- 87	23	39	24.572
	P- 73	24	35	29.164
	P- 74	25	61	41.963
	P- 71	26	66	53.669
GROUP B	P- 21	2	6	6.628
	P- 25	3	6	7.672
	P- 68	4	7	8.058
	P- 10	5	12	11.030
	P- 70	6	10	11.363
	P- 11	7	8	11.375
	P-112	8	10	12.276
	P- 22	9	12	14.944
	P- 60	10	14	15.769
	P- 40	11	16	15.961
	P- 51	12	13	19.224
	P- 26	13	19	21.235
	P- 45	14	20	22.596
	P- 76	15	16	24.090
	P- 82	16	20	24.905
	P- 16	17	19	25.301
	P- 32	18	23	27.120
	P- 77	19	27	39.159
GROUP C	P- 55	1	1	1.779
	P-100	2	1	1.950
	P- 52	3	1	2.300
	P- 72	4	2	3.303
	P- 3	5	6	9.245
	P- 89	6	4	11.628
	P- 56	7	8	12.742
	P- 61	8	6	13.027
	P- 17	9	5	13.300
	P- 59	10	10	17.385
	P- 88	11	8	17.856
	P- 46	12	12	18.063
	P- 43	13	8	19.981
	P- 75	14	10	23.514
	P- 4	15	10	24.312
	P- 33	16	11	24.947
	P- 41	17	11	25.634
	P- 29	18	12	26.606
	P- 49	19	10	27.140
	P- 48	20	14	29.010
	P-104	21	20	30.601
	P- 79	22	18	30.603
	P- 14	23	13	38.919
	P-113	24	16	40.434
	P- 47	25	26	55.560
	P- 50	26	25	73.743
GROUP D	P- 63	8	1	3.596
	P- 94	9	1	3.772
	P-109	10	1	4.795
	P- 6	11	2	6.620
	P- 92	12	1	9.823
	P-110	13	1	9.891
	P- 85	14	1	14.286
	P- 7	15	4	15.509
	P-103	16	5	16.373
	P- 93	17	2	16.547
	P-107	18	6	20.680
	P- 24	19	6	29.187
	P- 80	20	9	29.293
	P- 5	21	9	29.732
	P- 42	22	5	31.392
	P- 99	23	6	44.361
	P- 81	24	14	46.407
	P- 8	25	8	53.081
	P- 98	26	17	85.014

No May Report. 10 months total only: P-88; P-89; P-114.

Withdrawn: P-83

Division II

R- 3	6	1	5.641
R-10	7	3	5.670
R- 6	8	8	7.594
R- 5	9	7	9.176
R-16	10	4	12.906
R- 9	11	4	13.131
R- 2	12	8	13.893
R- 1	13	11	29.087
R-13	14	10	40.913

"The Lost Battalion"

"But Major, that ain't a road, that's a crease in the map"

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RAG AND STOCK CUTTERS

POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ NEVER LEAVE the secondary of a series transformer (instrument transformer) open. Excessive voltage will be induced in the secondary and may damage the instrument which the transformer serves, short-circuit the secondary with a jumper before disconnecting the leads.

◆ Condenser Condition Affects Economy

Since a variation of an inch in vacuum at the exhaust end of modern steam turbines may cause a difference of a pound or more in the water rate, it can be readily appreciated that it is of considerable importance to maintain the condensing equipment in its best possible condition. Economy in condenser operation consists in maintaining the desired vacuum with the smallest amount of water. Because of this fact, the condenser should be kept clean and free from scale. Scale on condenser tubes lowers the heat transmission and, as a result, more water is needed to condense a certain amount of steam.

The condenser and associated piping must be inspected frequently and overhauled, if necessary. Pipe joints must be examined for tightness and stuffing boxes on the air and circulating pumps should be carefully gone over for the same reason. A vacuum pump, no matter how efficient, cannot maintain high vacuum, if the engineer is careless about leaky joints. Two places often overlooked when inspecting for air leaks are the low-pressure valve rod and piston rod stuffing boxes of compound engines. It must be remembered that the pressure around these boxes is towards the inside, not towards the outside and air often leaks into the system at these points in considerable amounts. The amount of work done by the air pump in handling the air in solution is small in comparison to the work it generally does in handling air which enters the system through leakage. The latter is often from 10 to 25 times as much as that ordinarily dissolved in water.

The most frequent form of leakage in surface condensers is at the glands at the tube ends. Much trouble due to corrosion due to chemical and electrolytic action is experienced at these points and leaks inevitably result. Some success has been obtained in preventing trouble of this kind by spraying the tube ends with a black insulating varnish. Sometimes tubes are cut due to the direct action of the steam impinging upon them. This may be prevented by the installation of suitable baffle plates. Tubes exposed to the action of salt water, at times become brittle and crack.

◆ Varnishes to Use for Electrical Work

Varnishes for electrical machines vary in general from the clear baking varnishes to the air-drying varnishes and the finishing varnishes. Baking varnishes are, of course, superior to any of the others as insulators. Air-drying varnishes come next, while finishing varnishes are used only to protect the under coat of insulating varnish against moisture and to provide a smooth surface which will not become dulled when the apparatus is cleaned of oil and dirt with a benzine saturated cloth.

A fact of primary importance concerning insulating varnishes, and one which is not generally understood by repairmen, is that their dielectric resistance increases directly with the length of their baking or drying period, the slow-drying varnishes giving the highest degree of insulation and flexibility. Slow-drying varnishes contain higher percentages of gums and oils which blend as the solvent gradually evaporates, whereas the highly volatile material used in quick-drying varnishes evaporates so rapidly that blending is impossible and the result is a granular, crystalline coating which soon becomes a mass of minute moisture-absorbing cells. In the two classes of baking varnishes, black varnish should be selected in preference to clear varnish in all cases where a transparent coating is not essential, as the black varnishes produce a more flexible and better insulating film than the clear varnishes of their respective class. Clear varnish should be baked from eight to twelve hours or more at 100 deg. C. (212 deg. Fahr.). This baking varnish is usually proof against oil, acid and water and is employed for impregnating coils, linen, cotton, tape, canvas, paper, fiber, armatures, etc.

The air-drying varnishes dry in from one-half hour to two hours, are moisture-proof and acid-proof to a certain extent and are fairly good insulators. As in the baking varnishes, the black varnish is better and more elastic than the clear varnish and should be used whenever possible.

The finishing varnishes dry quickly, in one-quarter hour to one hour, and produce an insulating coating which protects against oil, water and acid. They are neither so tough nor so elastic as the other types of varnish and are not intended for use as insulators.

◆ Valves Should Have Attention

Valves are to steam, air and water systems what switches are to electric systems. They not only control in a large measure the operation, but they largely control the safety of the plant. They should be of high grade material, carefully chosen for the service in which they are to be placed, and kept in the best of repair. Valves should never be permitted to leak. Leaking means unequal wear on the disc, and cutting. This question of tightness, while affecting all valves, applies particularly to those valves which are normally closed or which remain closed over considerable periods of time. The most conspicuous cases of this are the blowoff valve and the safety valve, which require probably more attention than any other valves in the power plant.

Corrosion in the valve parts and especially the valve disc and seat may usually be prevented by proper choice of metals. The manufacturer can give good information along this line. Sticking may result from corrosion or incrustation, causing a sort of cement action between the disc and the seat or on the plug or stem. This is more likely to occur with gate valves or plug valves than with other types. Cutting of discs and seats by moisture or dirt in the steam or liquid may occur in valves which are partly open and in extreme cases when they are fully open. Gate valves should never be used for throttling purposes either on steam, air, or water. They will cut and they may chatter. Sticking may be due to tight screwing up of steam packing, especially if packing is worn down to an insufficient amount.

By choosing proper material, the above difficulties may be prevented or greatly minimized. Discs for globe valves are made of a great variety of materials. Soft composition or babbit for low pressure water; rubber composition or babbit for cold water up to 250 lb. pressure; semi-hard composition, babbit, brass, or bronze, for hot water and boiled feed; hard composition or hard bronze for steam up to 150 lb. pressure; nickel and alloys high in nickel for highest steam pressures and superheated steam. Valve seat rings should be made on non-corrosive metal of characteristics similar to metal discs.

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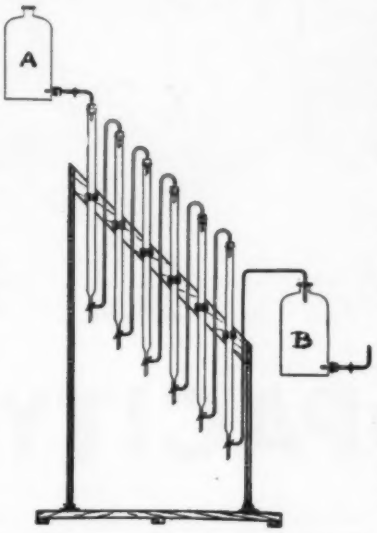
TECHNICAL DEVELOPMENTS

IN THE PAPER INDUSTRY

The following abstracts are of the latest developments found in the foreign press. Photostats and translations of complete articles can be obtained at cost price.

◆ Spruce Resin in Relation to Sulphite Manufacture

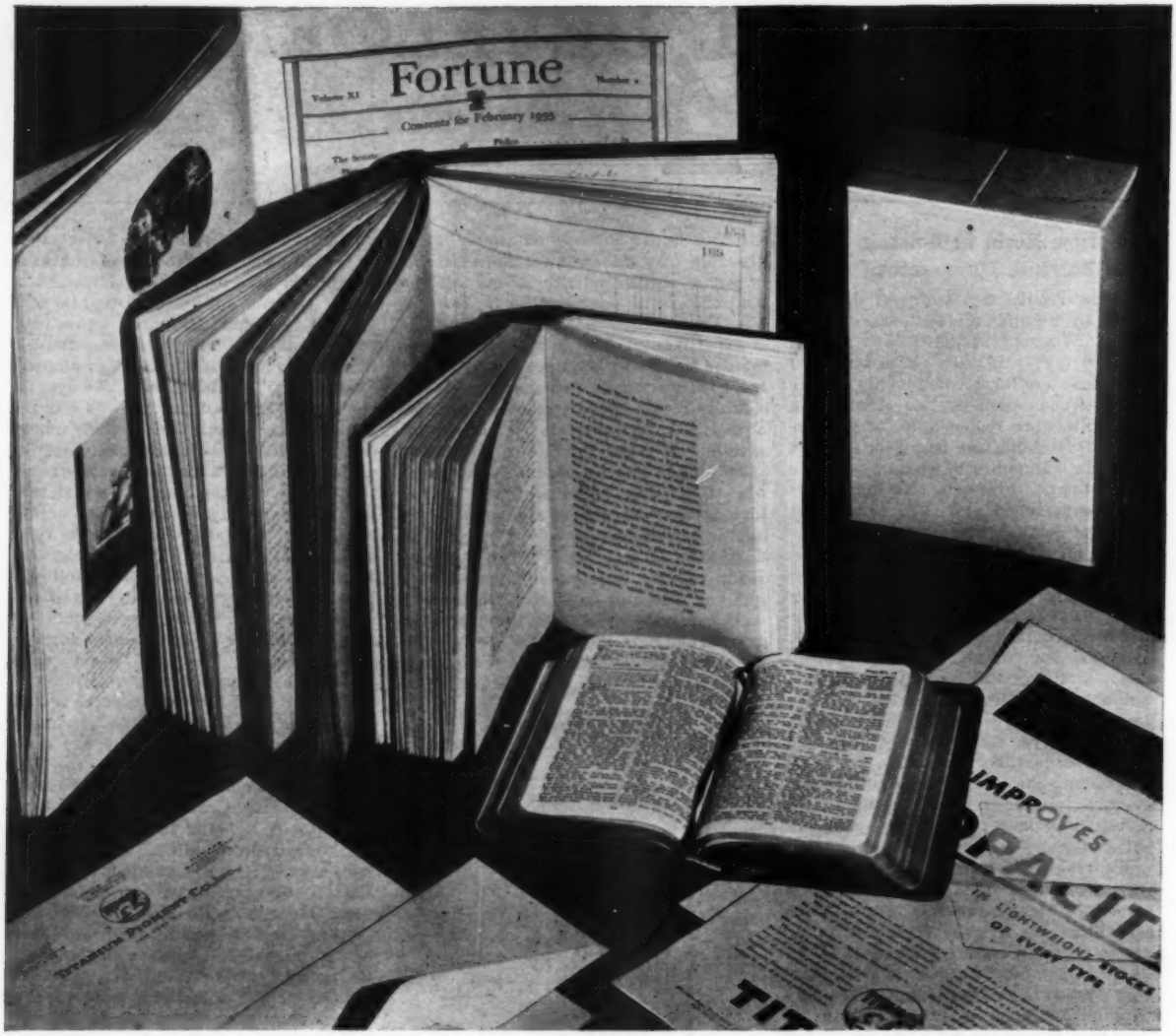
As the result of a study of diseases of fish by Stoeltzner (Deutsche medizinische Wochenschschrift, 50 [1932], 1929; 60 [1934] 75) the claim has been made that resinous components of the spruce wood used in the Königsberg pulp mills were responsible for the disease. This claim was based on the fact that small amounts of sodium abietate caused the death of eels, and that a diet of these poisoned eels then caused the death of cats. The present author (while he does not prove that waste sulphite liquors as a whole are not responsible for the disease) shows very definitely that none of the waste liquors examined contained abietates (the color reactions for which are very unreliable), and that Stoeltzner's categorical statement was incorrect. However, the present study, which is exceedingly comprehensive, deals largely with the spruce resins, their chemistry, and their fate during the process of sulphite manufacture, and it is from this viewpoint that it is of major interest. Spent sulphite liquor (previously fermented) was extracted in an apparatus shown in the illustration. This was done to avoid emulsions which readily form when separatory funnels are used, and in order to extract very large amounts of the liquor. The waste liquor which flows very gradually from container (A) through a battery of tubes holding the solvent into container (B). The extraction tubes have suitable side tubes, connecting them with the neighboring extractor (or container), and also have stopcocks, as shown in the figure. When the liquor has trickled through completely, (A) and (B) may be interchanged, and the process can be repeated until the solvent is saturated. The latter can be withdrawn and replaced with fresh solvent, until no further extractives are removed. Thus the process may be made practically continuous, using large amounts of spent fermented liquor. Another type of extraction apparatus in which the solvent is circulated in a closed system by distillation was also used, but not described. In this way, many thousand liters of fermented waste liquor (termed Schlempe) were extracted with ether alone, or with the following solvents, used successively: (a) petroleum ether, (b) benzol, (c) ethyl acetate, (d) ether. In a typical extraction, 100 liters of fermented waste sulphite liquor yielded 26 grams soluble in (a), 23 grams soluble in (b), 35 grams soluble in (c), and 10 grams soluble in (d). Only in the case of (b) were crystals of Holmberg's so-called sulphite liquor lactone obtained. It is probable from recent analyses that this is not a single individual, but all the possibilities of constitution of the lactone are carefully discussed, on the basis of experimental data. While hitherto the lactone has never been prepared directly from spruce wood, it seems very closely related to the component obtained from a distilled spruce resin, namely pinoresinol (Cf. Bamberger, Ann. Chem. 516 [1935], 162) having the molecular formula, $C_{20}H_{22}O_6$. The sulphite liquor lactone may be one of the products of ageing pinoresinol, e. g.— $C_{20}H_{22}O_6 \rightarrow C_{20}H_{20}O_6$. Differences between the gross resin content of spruce chips, slivers, and coarsely and finely divided sawdust were carefully studied. While the ordinary spruce chip yielded 0.47 per cent of petroleum ether soluble matter, and on successive extraction, 0.40 per cent ether



soluble matter, the fine sawdust gave respectively 2.54 per cent and 1.13 per cent. The following method was used to demonstrate the presence of the so-called sulphite liquor lactone in old spruce wood. The ether extracts of finely divided sawdust were extracted with 5 per cent NaOH, the soluble portion of which then contained the sodium salts of fatty acids and resins. The free acids in admixture are obtained by heating with glacial acetic, and of these only the fatty acids yield esters with methanol and sulphuric acid. This selective esterification serves to separate the residual free resin acids which are then extracted with boiling petroleum ether. In this way the insoluble, oxidized resin acids are fractionated from the soluble, unoxidized resin acids of the abietic acid group, $C_{20}H_{30}O_6$. When the material is refluxed with ether the oxidized resin acids remain in solution, while the difficultly soluble sulphite liquor lactone crystallizes out. Evidently the lactone is identical with Kawamura's Tsugaresinol (melting point, 256 deg. C.; specific rotation in acetone—54.5 deg.). The various abietic acids, their physical properties and chemical constitution as far as they are known, are discussed in detail, as are the reactions which may lead to their biosynthesis from simple sugars in the tree. The spruce resin acids obtained directly from spruce wood sawdust by ether extraction, followed by steam distillation and drying to constant weight in vacuum, are evidently very different from commercial rosin or spruce resins. The pulp wood resins showed the following analytical data:— d_{20} 1.08 to 1.09; acid number 117 to 130; saponification number 142-163; unsaponifiable matter, 14.5 to 15.4 per cent; iodine number (Hübl) 70.6 to 75.3; acetyl number 81.8 to 87.9; specific rotation at 20 deg. C, in alcohol + 21 to 23 deg.; melting point 158 to 161 deg. C. On tetrahydrogenation, the screened spruce sawdust resin yields a very small amount of a tetrahydroabietic acid almost identical with the so-called (—) —Abietic acid of Schulz. However most of the material does not react and this unreactive fraction ($C_{20}H_{30}O_2$) after several recrystallizations from alcohol, has a melting point of 166 to 167 deg. and a specific rotation of + 53 deg., and is probably identical with the pyroabietic acid of Fanica (Bull. Inst. Pin, 1933, No. 44, 151, and 181). The study is summarized in eight tables, in an analytical scheme, and by the use of numerous structural formulas. Prof. Dr. Emde, Director Pharmaceutical-chemical Institute; Königsberg. Cellulosechemie, 16, No. 2-3, 13-22 (1935).

◆ Dangers of the Electric Current

Some 15,000 casualties, 4,000 of which are fatal, is the annual average resulting from accidents involving the electric current in Germany. Those medium voltages that are met with daily seem to be the most dangerous ones. Ordinarily, voltages below 50 volts are not to be feared although one fatality involving 27 volts is reported. There are cases on record where voltages as high as 35,000 volts did not prove fatal. A current as low as 1/100 ampere may cause a fatality but there are very marked differences in various individuals, for one recorded case lived, despite the passage of a 7 ampere current which continued for 15 seconds. The psychological and



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— TAPPI FALL MEETING —
Philadelphia and Atlantic City
September 18, 19, 20, 21, 1935

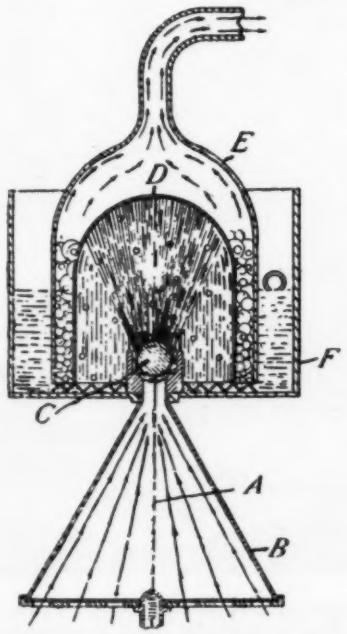
TITANOX

111 Broadway, New York; Carondelet Station, St. Louis; National Lead Co. (Pacific Coast Branch), 2240 24th St., San Francisco; Canadian Distributor: Wilson Paterson, Gifford, Ltd., 3552 St. Patrick St., Montreal; 132 St. Helen's Ave., Toronto.

physical factors are discussed, as well as are the methods of resuscitation. The latter include artificial respiration sometimes continued for 7 hours. Turtles and frogs seem to enjoy a high immunity to the electric current, while such animals as fishes, dogs and horses are hypersensitive. Dr. Fr., Wochbl. Papierfabr. 66, No. 3, 47 (Jan. 19, 1935).

◆ Aerating and Atomizing Water

In this invention (which may be used in controlling air temperatures in rooms) a jet of water (A) under high pressure, entrains air through a cone (B) and impinges on the sphere (C). The water is thus highly aerated and



atomized. Foam trapped in the dome (D) escapes at the bottom and the air is led off through the outer dome (E). Separated water enters the tank (F). F. Staines. Westminster. British Patent No. 409,918.

◆ Hard Impregnated Papers

This deals with the manufacture and the shaping of hard paper objects. The synthetic resins employed in the impregnation are ordinarily phenolplastic (phenol resins) or aminoplastic (carbamide resins). The various stages in which the latter are used are described. (The British abstractor states that uric acid and formaldehyde are used, but urea is probably meant—not uric acid —Abstractor). These aminoplastics first occur in the form of A-products or resoles, which may be cast and which are soluble in alkali and in ordinary organic solvents. On heating to 120 deg. these A-products are converted to B-resins or resitoles which do not melt, but which swell in such solvents as alcohol acetone, benzene, glycerine and caustic soda. These are adapted to pressing. When these B-resins are heated further at 6-8 atmospheres, for long time periods, or at 160-500 atmospheres for brief periods, the so-called C-resins or resites are formed. These cannot be melted or cast and are entirely insoluble in the solvents listed above. It is this resite which has the highest industrial value (mechanically, chemically and electrically). The manufacture of endless hard paper sheets, pipes and plates is discussed. For example, in sheet manufacture as shown in the illustration, thin, uniformly strong paper of 30-90 grams per meter is impregnated with a suitable resin in denatured alcohol in a machine about 2 meters in width. Complete and uniform penetration are essential. The sheet is slowly dried at 80-120 deg. C. in an apparatus that permits evaporation of the alcohol without actually hardening the resin. In the making of plates, the paper used ordinarily weighs 60-120 grams per square meter. The saturated sheets are cut to size, stacked into layers, which are then pressed into a single plate at 150-200 atmospheres, at 140 deg. C. Pressing under polished nickel, brass, or steel plates, imparts a high finish to the impregnated plate and also serves as a means of imprinting any desired design on the surface. The color of such plates varies, depending on whether phenolic or carbamide resins are originally used. The former are not lightfast, but the latter are not affected by light. The carbamide resins also apparently peptize the cellulose fiber, so that finished plates containing this material have uniform, non-fibrous structures. Prof. Buergel. Zellstoff und Papier (Feb. 1935); through Paper-Maker and Brit. Paper Trade J. 89, No. 4 (T. S.) 53 and 62 (1935).

◆ Nitro—and Aminolignins from Wood

This exceedingly comprehensive paper indicates that alcoholic nitration (using HNO_3 and alcohol in the ratio of 1:4) causes a satisfactory and nearly quantitative separation of cellulose and lignin, with the latter in the form of a crystalline aromatic nitrobody, termed nitrolignin. The structure of the latter has been investigated as fully as possible. It may be reduced (preferably and quantitatively by the use of titanium chloride) to an aminolignin, which is unstable in hot HCl. Nitrolignin prepared directly from spruce wood, as well as its acetylation, methylation, bromination and reduction products always showed the same residue:—$C_{19}H_{13}O_3$. Technical nitrolignin showed a very similar residue $C_{19}H_{12}O_3$. The amino-lignins from both sources were carefully studied. That the aromatic amino group was actually present was shown by diazotization and coupling with betanaphthol, giving rise to a blood-red compound insoluble in acid. The analytical data on these products included ultimate analysis, determination of nitro groups, various types of hydroxyl and of methoxyl groups. Bromination and acetylation derivatives were also studied, as were molecular weights. Structural linkages are discussed at length. For these details, the interested reader is referred to the original papers. K. Kürschner and H. Peikert. Technologie Chemie Papier u Zellstoff-Fabrikation, 31, No. 6, 85-95 (Dec. 1934), and Zellstoff-faser 32, No. 2, 19-28 (Feb. 1935).

◆ Paper Testing for Printing Properties

An important communication from the Ullstein Printing Plant in Berlin. The author points out that the usual methods of paper testing do not furnish real indices of its value in printing, which depends not only on the quality of the paper but on the tension during printing, the speed of printing, the support of the paper at the instant that printing takes place, on the ink, the form, and the special technique used. Conditions that must be met are discussed at some length, and illustrated diagrammatically. Evidently smoothness and hardness or softness of the paper surface, and the adsorptive properties of the paper are all of primary interest to the printer. Smoothness (glätte is defined as the intensity of contact which the surface of a sheet makes with a perfectly smooth, rigid plate depending on the effective printing pressure which causes a contraction of the volume of the surface openings or pores of the sheet. The so-called hardness of the paper surface is defined as the additional pressure that must be applied to that surface in order to obtain a definite increase in smoothness. The softness of a paper surface is the increase in smoothness that is obtained under a definite surface pressure. The relationship between this surface softness and hardness, and the softness and hardness of the entire sheet is of importance. Assuming that there are 4 typical papers:—(a) rough and hard, (b) rough and soft, (c) smooth and hard, and (d) smooth and soft, and if we arbitrarily choose as criterion of surface hardness that increase in pressure which is required to actually double the smoothness of a surface subjected to one kilogram per square cm. (i.e. to decrease the surface openings or pores to ½ their volume as it existed under the initial pressure) the following data are obtained in terms of kg. per sq. cm. These are the surface hardness numbers:—for (a) 51.0; for (b) 2.7; for (c) 42.0; and for (d) 2.9. If as a criterion of surface smoothness we choose the percentage increase in the smoothness obtained when the surface pressure is increased from 1 kg. to 100 kg. per sq.

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cm., the figures (which show the percentile decrease in surface pores are 56 per cent for (a), 96 per cent for (b), 56.7 per cent for (c) and 93.3 per cent for (d). These may be termed surface softness numbers. The difficulties in obtaining such experimental data are clearly outlined. Surface porosity (i.e. volume of the surface openings) is not readily distinguished from that of the inner portion of the sheet. However it has been clearly shown that horizontal

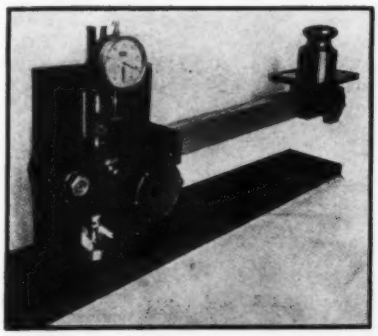

Figure 1

porosity can be measured, that these measurements are in fair accord with calculated values (i.e. of the same order of magnitude), and that such surface or horizontal porosity has only a subordinate effect on the methods for determining smoothness. The so-called smoothness numbers were determined in a Fuess apparatus (which has frequently been described in the literature, and to which the author gives a number of American and German references). These numbers are in terms of the time (measured in seconds) required for 10

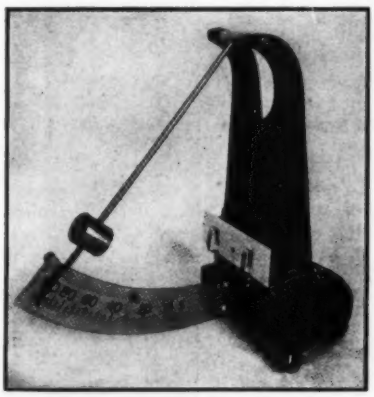

Figure 2

cc. of air to be sucked between a paper surface and a polished ring shaped surface at a reduced pressure of 0.5 atmospheres. The circular hole in the plate is 10 square centimeters, the paper sample being under a pressure of 1 kilogram per sq. cm. The author has tabulated smoothness and porosity data for 11 samples of paper. The surface hardness or softness of a sheet is a component of its total hardness or softness. Since surface data cannot be obtained readily, the author has devised methods for determining the total softness of paper which not only furnishes indirect evidence regarding the surface but which has a direct bearing on the printing qualities. This total softness is gauged by its compressibility, whereas the surface softness indicates the extent to which that surface can be rendered smooth. Fig. 1 shows the instrument for measuring compression of the paper under a resting load. A vertical pin makes contact with one square centimeter of the surface. When the side arm is arrested, the pin presses down with a force of 1 kilogram. When the lever functions, this force becomes 100 kilograms per square centimeter. The downward motion of the contact pin is followed by means of a measuring gauge, the reading on which is taken after about one minute. So as to get a greater deflection of the pointer of the gauge and a more accurate reading, 10 sample strips are stacked one above the other, and each sheet is separated from the next by means of a thin steel plate. In a control experiment due correction is made for the compressibility of these plates. The method furnishes no measure of the surface softness, nor of differ-

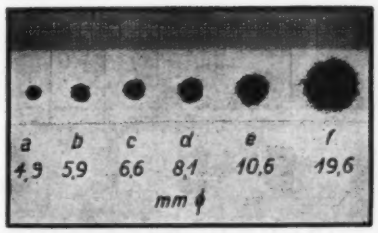

Figure 3

ences in the two sides of the sheet. Compression of a sheet under the influence of a blow is measured by means of an instrument shown in Fig. 2. Here the essential feature is a pendulum, the contact surface of which is curved (with radius of curvature of 10 cm.) and so constructed that it strikes the surface of the paper with the force of a 100 gram weight traveling 1 meter per second. The sample strip is fastened between clamps over a strip of hard steel, and the spherical end of the pendulum is coated with a thin layer of printing ink. As a measure of the softness of the paper, the diameter of the mark made by the pendulum is measured and the depth of the impress may also be calculated in mm. by dividing the square of this diameter by 800. Data are given for cellophane (a); newsprint (b); printing papers (c) and (e); offset printing paper (d) and blotting (f). The results of these tests are shown in Fig. 3. The differences observed for the upper and wire sides of several papers are also given. The elasticity of the paper may also be determined by the instrument in Fig. 2 by measuring the recoil of the pendulum after it strikes, as indicated on the scale in the lower part of the figure. The resistance of paper to deformation loads is measured by the device shown in Figs. 4 and 5. The sheet to be tested is clamped between the ledges on the sides of a base plate so that it retains a semicircular form (in cross section) with a 10 cm. diameter. The sample and the base plate, in the center of which is a rod exactly 4 cm. in height, is then carefully tared on a platform scales. In the test, a glass plate (externally supported) at such a height that its lower surface is just 4 cm. above the base plate when the balance is at rest, is then brought over and

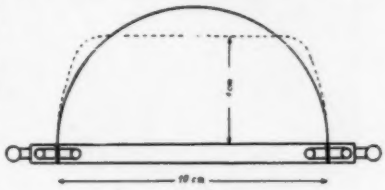

Figure 4

in contact with the top surface of the paper sample. The scales are thus thrown out of equilibrium, and the weights that must be added to restore the balance serve to measure the force required to depress the sheet, as indicated schematically in Fig. 4. The stiffness of the paper is calculated in terms of grams per cm., assuming the paper strip to be one cm. in width. The actual width of the sample sheet used in the test is not given. The importance of all these tests when applied to news and printing papers, the effect of varying degrees of moisture, etc. are shown in tabulated form. The adhesion of printers ink by paper has also been made quantitative. Here a weighed sample sheet, 100 sq. cm. in area, is printed under standardized conditions by a printing plate, completely inked. After the elapse of definite time periods, the excess of ink is removed from the strip by bringing it into contact with a revolving paper sheet, which during some 10 revolutions removes all but negligible traces of this excess. The time required is 1.5 seconds. Thereupon, the gain in weight of the sample is a measure of

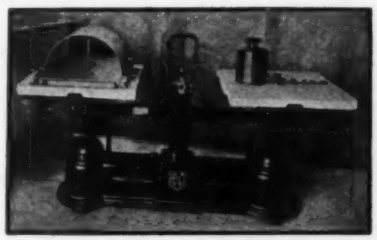

Figure 5

the adhesion of the ink. Various tabulated data, for different types of paper, varying types of ink, and varying time periods are given, together with graphs. Of special interest are the extensive comparative tests recorded for 20 Danish newsprint papers and for newsprint taken from British, Scandinavian, and Berlin newspapers. The article carries 18 illustrations and 8 tables. Julius Bekk; Papier-Fabr. 33, No. 16 (T.S.) 137-43; No. 17 (T.S.) 146-151, 1935).

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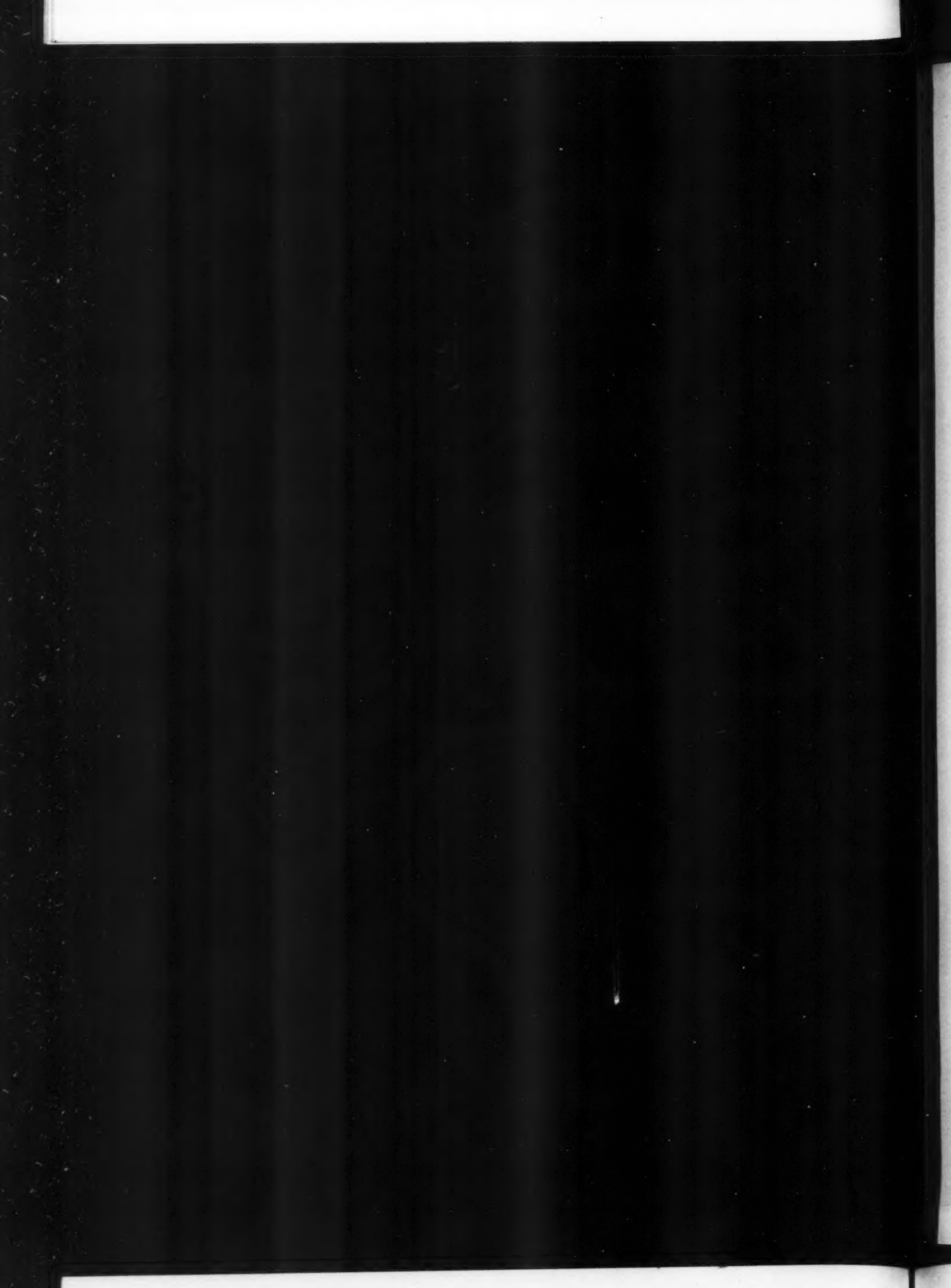


PAPERMAKING PATENTS

IN THE UNITED STATES

Inquiries with reference to any of these patents should be addressed to James Atkins, Munsey Building, Washington, D. C.

Compiled by James Atkins, Registered Patent Attorney

2,002,404—Pulp Strainer. Marcel Lamort, Vitry-le-Francois, France, assignor to Etablissements E. & M. Lamort Fils, Vitry-le-Francois, France. Application August 12, 1933. Serial No. 684,915. In France August 29, 1932. 6 Claims. (Cl. 92—33). A straining apparatus for paper pulp comprising a tank for said pulp, a drum located in said tank having a periphery forming a straining surface, said periphery being formed of inclined rings assembled side by side at their bases, means causing an irregular alternating displacement between said pulp and said drum and means for rotating said drum about its axis.

2,003,150—Pulp Screening Machine. Nelson Moore Knight, Weymouth Heights, Mass. Application October 29, 1934. Serial No. 750,481. 10 Claims. (Cl. 92—34). A pulp screening machine comprising a casing having an inlet at its upper end and a discharge opening at its lower end, a screen element situated within the casing between the inlet and the discharge opening and having a vertical screening wall, means for forcing the pulp back and forth through the screening wall as said pulp flows from the inlet to the discharge opening, screen-cleaning runners on the inlet side of the screening wall and means to produce a relative movement between said runners and said wall.

2,003,404 — Slitting Mechanism for Paper Making Machines. Charles W. Valentine, Watertown, N. Y., assignor to The Bagley and Sewall Company, Watertown, N. Y., a corporation of New York. Application September 16, 1931. Serial No. 563,017. 13 Claims. (Cl. 164—65). In a web slitting mechanism, the combination of rotary slitters, a stationary support over which the web travels, said support including a casing of resilient metal having a horizontal groove in which are seated a plurality of complementary slot forming blocks, two adjacent blocks forming a slot between them, means for adjusting the walls of the casing toward and from each other to facilitate the positioning and removal of the blocks, and means for moving the slitters into and out of the slots.

2,004,032 — Paper Napkin Embossing, Printing, and Folding Machine. John S. Burt, Highland Park, N. J., assignor to John Waldron Corporation, New Brunswick, N. J., a corporation of New Jersey. Application November 12, 1930. Serial No. 495,259. 21 Claims. (Cl. 270—78). In a folder, a rotating roll having pairs of circumferentially-spaced, longitudinally-extending gripping jaws normally in gripping relation to one another, a tucking blade associated with the roll and operating in timed relation thereto for tucking a web between the jaws to be held thereby during rotation of the roll, a longitudinally-extending cutting blade arranged between adjacent pairs of jaws and a stationary cutter blade associated with the roll for coaction with said cutter blade to sever the trailing portion of the web from that gripped in the jaws.

2,004,143—Absorbent Paper Dispensing. Vanderveer Voorhees, Hammond, Ind. Application July 30, 1932. Serial No. 626,792, 7 Claims. (Cl. 92—68). An absorbent paper towel which has been treated in a restricted area with a water resistant size to provide a grip which will retain its tensile strength when seized with wet hands.

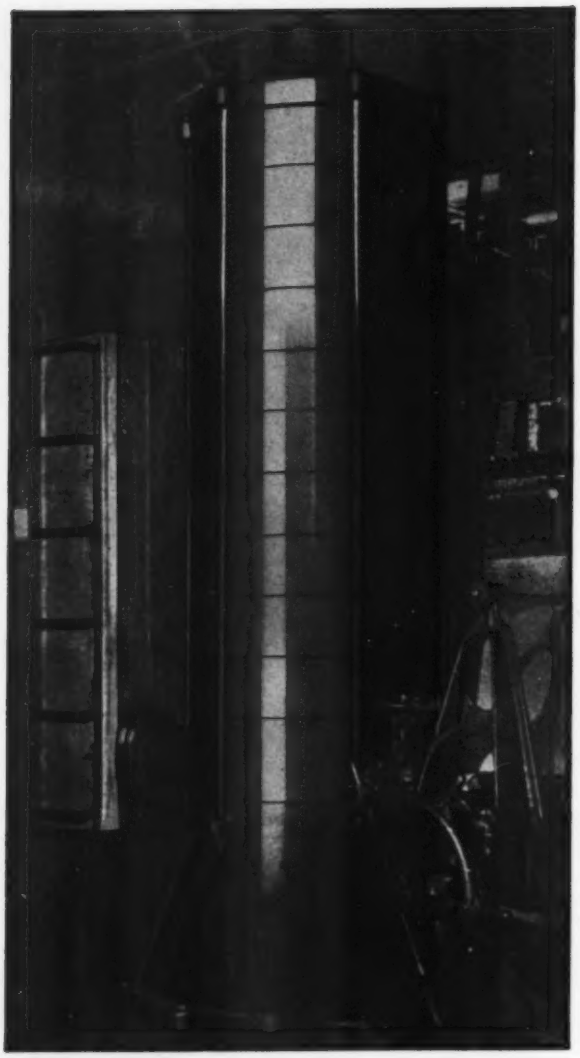
2,004,205—Smelting Furnace for Black Liquor. Alfred G. Kernin, Mosinee, Wis., assignor to Mosinee Paper Mills Company, Mosinee, Wis., a corporation of Wisconsin. Application January 9, 1932. Serial No. 585,656. 2 Claims. (Cl. 23—277). A furnace for the regeneration of black liquor having a two-part bottom, each part being located at a different level to thereby provide an upper combustion zone and a lower reduction zone, the bottom of the upper zone extending upwardly and rearwardly from the reduction zone, a tuyere for introducing a mixture of black liquor and air to the combustion zone, said tuyere extending to the rear of said combustion zone to direct said stream away from said reduction zone and ducts for introducing air to the lower combustion zone.

2,004,604 — Box Making Machine. George F. Ford, Los Angeles, and Walter F. Pittman, Huntington Park, Calif., assignor to Fibreboard Products Inc., San Francisco, Calif., a corporation of Delaware. Application February 14, 1933. Serial No. 656,692. 14 Claims. (Cl. 93—47). A machine for making boxes from blanks comprising means for holding a nest of the boxes, a forming head shaped to fit the interior of the box, a plurality of movable elements between which the head is adapted to pass, means for positioning a blank between said head and elements, means for moving the head against the blank to drive the latter between the elements, means operating in time with the head moving means for moving said elements against portions of the blank for folding said blank about the head to form a box, and means for continuing movement of the head to drive the newly formed box past said elements and into the nest.

2,004,878—Container. Malcolm S. MacNaught, Yonkers, N. Y., assignor to Hixon Electric Co., Boston, Mass., a corporation of Massachusetts. Application August 17, 1932. Serial No. 629,134. 3 Claims. (Cl. 229—87). A container-forming blank of transparent sheet material comprising a base panel area having end and side adhesive wings cooperatively foldable thereon to form the container, one wing having a plurality of apertures for receiving mechanical locking elements to secure the container and contents to a support and an aperture to receive a part of the contained article; a scored adhesive-carrying area in the base area severable sufficiently from the base and foldable on itself to be secured along a plurality of its edges to the scored area to form a closed pocket for said locking elements; and a supplementary separable wing on the blank, foldable to form a hood-like cover for said part of the contained article in one of the apertures and of a construction to project through the aperture when the article is assembled with the container.

2,004,908—Folding Carton. Earl B. Whitehead, Norwich, Conn., assignor to Atlantic Carton Corporation, Norwich, Conn., a corporation of Connecticut. Application July 31, 1933. Serial No. 683,041. 2 Claims. (Cl. 206—45). A foldable shipping and display box of the class described comprising in combination, vertically-extending front and rear walls of equal width hingedly connected by side walls of equal width, a bottom closure flap member substantially equal in width to said front and rear walls having a main body portion for extending in a substantially horizontal position between the lower marginal edges of said walls and a tab portion for lying adjacent the inside of said front wall, said body portion being provided with an opening therein, and a foldable tier-forming member hingedly connected to the lower marginal edge of said front wall and scored along certain lines parallel with said lower marginal edge of the front wall to include successively a connecting section adjacent said front wall for lying adjacent the outside of said bottom flap member, a spacer section for extending upwardly within said opening at substantially right angles to said bottom flap member, a supporting section for extending in substantial parallelism with and above said bottom flap and another spacer section for extending in parallelism with said first spacer section.

2,005,105—Safety Paper. John Wallace Neff, New Rochelle, N. Y., assignor to Milton C. Johnson Company, New York, N. Y., a corporation of New York. Application June 23, 1930. Serial No. 463,365. Renewed April 18, 1933. 6 Claims. (Cl. 91—67.95). A safety paper carrying cobalt ferro-cyanide.



To Manufacturers of Offset Papers

RECENT and extensive research by an authoritative agency has shown that paper for offset printing should have a minimum of hydration or gelatinization of the fibers. In other words, stock for such paper should receive the least possible amount of beating and jordaning that is commensurate with desired sheet strength and surface characteristics.

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The COMMERCIAL OUTLOOK

New York, July 1, 1935.

THE momentous decision of the United States Supreme Court invalidating the N.R.A. came as something of a bombshell to business interests. The paper industry, along with other basic industries, was thrown into a turmoil, so to speak, for a time. However, now that approximately a month has passed since the all-important Court ruling, it can be stated that the paper industry is going ahead but slightly disturbed after the first shock when the significance of the decision was fully appreciated. Most divisions of the paper industry are striving to adhere to the fundamentals of the recovery program expounded by the N.R.A., and adhering they are. There has been, perhaps, some digression, but by and large the industry is proceeding along the road to a better understanding among manufacturers and members of the trade, and to a maintenance of regulations which are serving to make for improvement within the industry, actual and sentimental.

A survey of the industry just completed indicates that the gains scored by the general paper trade during the first quarter of the current year as contrasted with the same period a year ago have narrowed to some extent during the second quarter. This, it might be noted, is not unseasonal, as paper business ordinarily simmers down as the summer months approach. There are innumerable indications, however, the survey avers, that basically conditions in the industry are strengthening, with the price structure fairly firm, new uses being devised constantly for its products, and better grades of paper coming more into prominence, in keeping with the country's rising purchasing power.

Because of the adverse weather conditions in many sections of the country during April and May, which restricted consumer buying to no little extent, both output and distribution of paper for the first five months of this year failed to equal the percentage of gain estimated at the beginning of 1935. As the trend has again started upward, much of this slack may be taken in before the close of the third quarter, as wholesalers now are displaying more willingness to make commitments beyond immediate requirements. For some divisions of the trade the fall outlook is viewed as the brightest in several years.

Notwithstanding the recession reported in some branches of the industry, production of paper thus far this year has been 5 to 10 per cent in excess of that turned out during the corresponding months of 1934, according to estimates and such figures as are available, the volume increase representing tonnage as price fluctuations have been narrow. Industrial expansion undoubtedly has played an important role in the widening distribution of paper, as manufacturers are turning more and more to paper for packing purposes, a more insistent call having developed particularly in the furniture, hardware, brewery, confectionery, and apparel trades.

Reports from within the industry tell of some groups of paper mills operating on a fairly active scale. Fine paper mills in New England and elsewhere are reported securing an appreciable increase in business. Board mills are well engaged, with prospects of further increase in operating schedules as their busy season draws on. Building paper mills are enjoying larger business than at any time in years; it is stated the rising demand for all grades of building paper has lifted the volume 30 to 40 per cent above the average of the last five years.

Advertising volume in newspapers in May held the gains established in May, 1934, and added 2.6 per cent to that total, according to figures collected from 81 cities by *Advertising Age*. Lineage in the 81 cities during May last year was 164,043,000, while in May this year it was 168,257,000. April advertising scored a gain of 7 per cent over the similar month a year ago, it was disclosed by the general index of advertising compiled by *Printers' Ink*. The figure, which stood at 79.8 for April, compared with 78.8 for March, an increase of 1.3 per cent.

Production of newsprint in the United States in May amounted to 84,323 tons, compared with 89,726 tons in May last year, while Canadian mills produced 242,693 tons, or almost the same as the output of 242,539 tons in May a year ago. The aggregate output for both countries reached 327,016 tons, compared with 332,265 tons in May, 1934, a decline of 5,249 tons, or 1.5 per cent, according to figures compiled by the News Print Service Bureau. For the first five months of this year, newsprint production was less than one per cent behind a year ago, the total amounting to 1,437,096 tons for both the United States and Canada, against 1,446,963 tons a year ago in the same time, a decrease of 9,867 tons or 0.68 per cent.

Canadian production was ahead of last year, totaling 1,052,883 tons as against 1,031,996 tons in the first five months of 1934, an increase of 20,887 tons. March this year is the only month since May, 1933, to show a decline from the corresponding month of the preceding year. United States mills in the five months turned out 384,213 tons of newsprint, compared with 414,967 tons in the same period a year ago, a decline of 30,754 tons or 7.4 per cent. Shipments from Canadian mills were substantially in excess of production, shipments from United States mills were somewhat below production, and the excess of shipments over output for both countries was 7,896 tons, reducing stocks at mills at the end of May to 71,314 tons.

Production of paperboard in the United States during April last totaled 260,365 tons, contrasted with 275,770 tons in the preceding month, and 244,334 tons in April, 1934, according to the Census Bureau's monthly compilation of board statistics. The April output brought the aggregate for the first four months of this year up to 1,050,031 tons, against 952,830 tons in the same period of 1934, and 872,578 tons in 1933. Board mills produced at 64.6 per cent of their rated capacity in April last, against 68.9 per cent in March this year and 66.1 per cent in April, 1934. New orders received by manufacturers in April called for 253,662 tons of board, compared with 268,360 tons in the month before, while unfilled orders held by mills at the end of April were for 79,296 tons, against 79,049 tons a month preceding.

◆ ◆

◆ J. W. Barnett Joins Babcock & Wilcox

J. W. Barnett, recently Director of the Division of Construction and Finance of the U. S. Shipping Board, will, on July 1, join The Babcock & Wilcox Company's Marine Department.

Mr. Barnett was graduated from the U. S. Naval Academy in 1908 and continued in the service until his resignation in 1913. He later became associated, in an executive capacity, with the Lake Torpedo Boat Company and the Marion Steam Shovel Company. He is a member of the Society of Naval Engineers and of the Society of Naval Architects and Marine Engineers, and has had wide experience in ship design, construction, and operation.

◆ THE ROLLWAY BEARING COMPANY of Syracuse, New York announces that it has appointed Fred W. Kulicke, Philadelphia Representative, taking the place of John W. Firmin, deceased. Mr. Kulicke has had extensive experience in both sales and engineering work with E. G. Budd Mfg. Co., Eclipse Machine Company, Baldwin Locomotive, Hess Bright Ball Bearing Company and others. His present appointment covers both the engineering and sales representation for Rollway in the territory named.

◆ EFFECTIVE August 1, 1935, Oliver United Filters, Inc., New York, Chicago and San Francisco, announces the addition to its sales staff, paper and pulp division, of Roderick O'Donoghue. Mr. O'Donoghue has long been identified with the paper industry, having been associated with the International Paper Company for the past 20 years.

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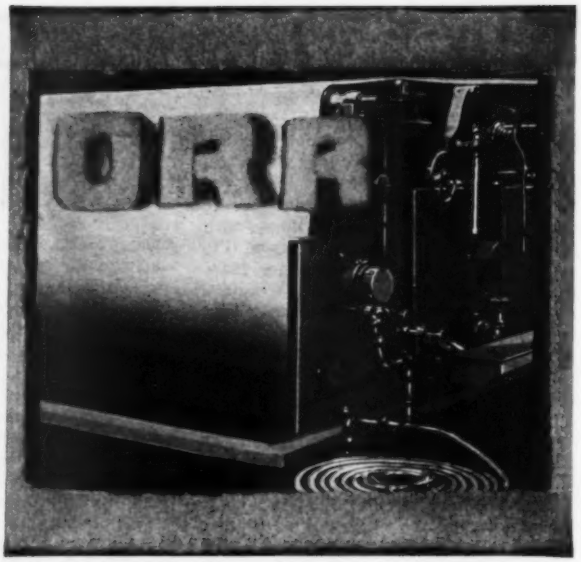

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Piqua, Ohio

TAPPI FALL MEETING, Philadelphia-Atlantic City, September 18 to 21, 1935

ORR FELTS

Domestic RAW MATERIALS

◆ Papermaking Rags

While a firm tone marks prices of practically all grades of papermaking rags, it is the lowest class of rags, or roofing stock, which is providing the market feature currently. Strength in roofing rags seems due more to the supply situation than to any voluminous buying on the part of consuming mills, although it is true felt paper mills have been purchasing on a fair scale recently. Indications are prices of roofing rags are being pushed upward by a decided scarcity, accompanied by a hardening of foreign markets which has run costs of imported roofing stock up well above prevailing prices on domestic rags.

Generally speaking, the rag market condition is not nearly so favorable to buyers as it has been during the last few years. Supply is the basic reason for this somewhat reversal of the market position. Rags simply are not being produced and collected in as large quantities as in years gone by, and in addition, the United States is becoming more of an exporting nation in rag stock than an importing market—a truly turnabout of the former situation. Paper manufacturers are not hampered by any actual shortage of rags, yet the available supply of almost every grade appears just short enough to be creative of a firmer undertone than the market has witnessed in a lengthy time. It is perhaps not going too far to state that any appreciable increase in consuming demand for any particular grade would be quickly followed by a considerable advance in market prices of such rags.

The trend in roofing rag values has been steadily upward in recent weeks, and mills now are paying 1.05 to 1.10 cents per pound f.o.b. shipping points in the East for No. 2 domestic classification roofing, and up around 1.40 cents for No. 1 stock. Even roofing bagging, or No. 3 roofing stock, is selling at 95 cents to $1 per hundred pounds at dealers' points. Foreign dark colored cottons are quoted to mills at 1.30 and 1.35 cents a pound ex dock New York for mid-European rags of this description, and 1.15 to 1.20 cents for Spanish or other southern European dark cottons, while foreign linsey garments are said to be unobtainable below 1.75 cents per pound, ex dock basis.

New cotton cuttings are bringing firm prices in sales to fine paper mills notwithstanding that consumers are purchasing in very reserved fashion, seldom ordering supplies until they are in definite need of the raw material. No. 1 new white shirt cuttings, which are being exported from the United States in substantial quantity, are reported priced at 6 cents to slightly higher per pound f.o.b. shipping points. Fancy shirt cuttings are quoted at around 2.25 cents a pound, light silesias at 4.25 cents, unbleached muslins at 6.50 cents, blue overall cuttings at 3.75 cents, and washables at 1.75 cents f.o.b. shipping centers. New linen cuttings are in moderately good demand, and quoted at 10 to 10.50 cents per pound for white and 9 cents for grey linen at shipping points.

Paper manufacturers are manifesting better interest in old white cottons and thirds and blues, and are reported paying around 3 cents a pound for No. 1 repacked old whites, and 1.35 cents for repacked blues f.o.b. dealers' points.

◆ Old Paper

While the high grades of old paper have been about stationary in price, the low and bulky descriptions have recorded at least slight advancement and are exhibiting a distinctly firming trend. This apparently reflects a fairly heavy consumption by board mills, which are said to be quite busy and using raw material in comparatively large tonnage. Folded newspapers have risen in the East to a price level of 27½ cents per hundred pounds f.o.b. New York, and No. 1 mixed paper has advanced to 22½ cents at shipping points. In the Middle West, above these prices are being paid by mills. Old corrugated boxes are a firm item, bringing 45 cents per hundred pounds in the East f.o.b. dealers' points, and old kraft paper is also firm at 90 cents to $1 a hundred pounds. Shavings are about steady quotably at 2 to 2.25 cents per pound for No. 1 hard white, and 1.60 to 1.75 cents for No. 1 soft white, while most dealers ask 2.25 to 2.35 cents for No. 1 hard white envelope cuttings. Books and magazines are selling at 50 cents a hundred pounds at shipping points in the East, while ledger stock is 95 cents to $1 for white and 70 to 75 cents for colored.

◆ Chemical Pulp

From all accounts and signs, the wood pulp trade is adhering firmly to the open filed minimum sales prices on sulphite and kraft pulp, following the Supreme Court's momentus decision invalidating the NRA. Pulp producers abroad and in the United States have expressed their intentions of maintaining these established price bases, and while it is possible that in some out-of-the-way instances chemical pulp has been sold at slight recessions, generally the trade is sticking steadfastly to the minimum prices. That the pulp market has quieted perceptibly since the NRA decision is commonly acknowledged; in fact, buying at present by paper and board manufacturers is of exceedingly slim proportions, mostly confined to covering immediately urgent needs.

However, prime bleached sulphite holds to a quotable basis of 2.50 cents to slightly higher, depending on grade, ex dock American Atlantic seaboard, and prime unbleached sulphite is 1.90 to 2.05 cents a pound, similar basis. Manufacturers of domestic bleached soda pulp are maintaining a price of 2.50 cents a pound delivered consuming mills and evince no inclination to alter this quotable level. Domestic or Canadian kraft pulp of first quality is around 2 cents a pound delivered paper mills.

◆ Chemicals

Casein prices have eased a bit more to 11.50 to 11.75 cents for domestic standard ground and 12 to 12.25 cents for the fine mesh, with the Argentine product about 13.25 cents for the finely ground. Demand for caustic soda is reported fair and quotations are maintained at 2.60 cents for the solid product f.o.b. works. Salt cake is quoted at $12 to $13 and chrome salt cake at $11 to $12 per ton at works. Special papermaking starch is on a quotable basis of 3.59 cents a pound, in bags, f.o.b. works.

◆ Rope and Bagging

"Anything jute is moving readily and at very firm prices," say trade reports. Bagging for roofing mills is especially wanted and is bringing one cent per pound, or very close to this price, f.o.b. points of shipment. No. 1 scrap burlap is in the quotable vicinity of 1.40 cents a pound, and probably is fetching higher in some cases, while old gunny bagging is scarcely obtainable under 1.45 cents for domestic or 1.60 cents for foreign. Old rope is under neglect of paper mills, and in a very quiet market position. Domestic No. 1 old manila is nominally 2 cents a pound at shipping points, with purchases apparently feasible at a little less in some quarters.

◆ Pulpwood

Consumers are taking pulpwood supplies against contracts, but open market demand is restricted. In fact, reports tell of very limited activity in the market, and prices, while showing no definite changes, are anything but firm.

◆ Mechanical Pulp

There is a lack of important demand for mechanical pulp, and the market tone is decidedly on the soft side. Some of the reports received indicate groundwood is being sold, in certain cases at any rate, at surprisingly low prices. Canadian mills are seeking orders, and Scandinavian or other European groundwood is being marketed in this country at depressed price levels, with the result domestic producers find it necessary to accept low values to compete in the market. Domestic groundwood is somewhere in the vicinity of $24 per ton f.o.b. grinding plants, depending on the freight haul, while Canadian wood is reported available at about this same price level delivered consuming centers, or less. There have been reports of mills in Canada selling groundwood as cheaply as down around $14 to $15 a ton f.o.b. producing points across the border, in order to compete in the market with European offerings.

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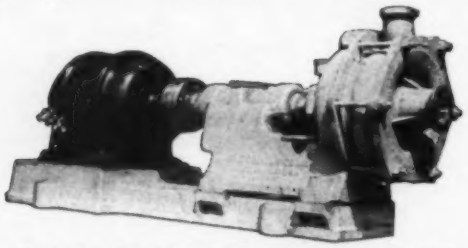

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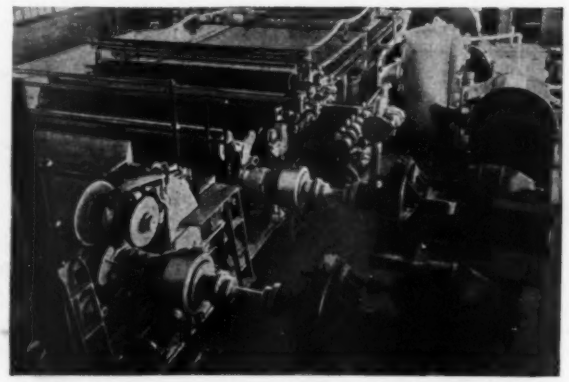

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020-147

GENERAL ELECTRIC

Import and Export MARKETS

IMPORTS

◆ Wood Pulp

From all accounts and indications, market price levels of chemical wood pulp are holding steady despite the Supreme Court's decision ruling out the N.R.A. The situation in the pulp market, trade reports state, has not changed. Established minimum open-filed prices obtain as selling bases, and pulp manufacturers abroad and in the United States are adhering to these prices. What will be the outcome ultimately is rather problematical, but opinion in the trade is that no radical alterations in pulp prices will be seen over the next few months, if not longer. Many pulp manufacturers and importers assert that advancement in the market is just as likely as a turn in the opposite course, especially should consuming conditions improve and lead to a broader demand for pulp.

Every sign points to producers of pulp intending to maintain the price stability effected during the last year and a half. In fact, manufacturers in Scandinavia have made announcements to the effect they will continue the prices established in sales to United States consumers in recent months. Domestic producers also have declared their intention of continuing the price stabilization program. At the same time, it is agreed that with the N.R.A. annulled, there will be wider latitude for market operations, and whether or not some pulp sellers will break away from the price-filing arrangement remains to be seen.

That activity in the imported pulp market has been on a narrow scale since the N.R.A. decision is commonly reported. Paper manufacturers, evidently puzzled over the effect on their own market and presumably fairly well supplied with their principal raw material, have kept out of view as buyers of pulp, and very limited business of much importance has been done. Buying for next year, in particular, has been brought to an almost complete halt. Occasionally buyers have come into the market to acquire pulp for shipment from abroad during the remainder of this year, but in nearly every instance 1936 requirements have been temporarily shelved. It is reported that a moderate volume of orders for next year are on importers' books, practically all of which were placed prior to the decision on the N.R.A., but that contracting for the year ahead does not commence to measure up to that usually seen at this point in the year.

Bleached sulphite of foreign prime grade is quoted at 2.50 cents per pound to slightly higher, depending on quality, ex dock American Atlantic seaboard. Prime unbleached sulphite is 1.90 to 2.05 cents ex dock basis, and prime standard Scandinavian kraft pulp 1.70 cents. Kraft is firm decidedly. Mills in Sweden producing this class of pulp are said to be well sold up for this year, and exhibiting no disposition to accept orders under the 1.70 cents price. Many in the trade confidently believe an advance in kraft will be witnessed before long.

Imports of wood pulp into the United States during April were substantially below the preceding month's receipts in total tonnage but showed a gain over arrivals in the similar month last year. The April importations amounted to 77,109 net tons of chemical pulp, valued at $3,373,263, according to official figures issued by the U. S. Department of Commerce, compared with 106,919 tons of a declared value of $4,372,558 imported in March this year, and 68,884 tons of a value of $3,118,428 in April a year ago. It is customary for imports to trend off in April, due to the closed navigation season for pulp steamers over the Baltic. The April receipts were the smallest by a good margin in any month since April, 1934.

Groundwood imports in April were 9,015 tons, valued at $160,945, comparing with 12,476 tons of a value of $194,650 in the preceding month, and 12,717 tons of a value of $233,827 in the similar month last year. The imports of chemical pulp during the first four months of the current year totaled 441,096 tons, representing an increase of 20,899 tons or not quite 5 per cent compared with 420,197 tons imported in the corresponding time last year. Mechanical pulp imports in the four months aggregated 48,274 tons, a gain of 3,985 tons or a shade less than 9 per cent above the 44,289 tons in the first four months of 1934.

◆ Paper Stock

The United States imported 18,830,249 pounds of rags for papermaking, valued at $190,256, in April last, contrasted with 13,043,114 pounds of a value of $124,230 in the same month last year, and making a total for the first four months of this year of 50,389,091 pounds of a declared value of $498,420, against 35,056,848 pounds of a value of $403,850 in the corresponding period of 1934, according to U. S. Department of Commerce figures. Imports of miscellaneous paper stock, embracing old rope, bagging, waste paper, etc., amounted to 5,940,573 pounds of a value of $85,238 in April, making a total for the first four months of the current year of 20,964,757 pounds, valued at $298,654, compared with 21,522,455 pounds of a value of $329,128 in the similar time last year.

◆ Paper

Imports of paper and paper products into the United States in April reached a total value of $7,333,474, showing an increase over the $7,134,766 worth imported in the preceding month, but a decline from the importations valued at $7,567,345 in April, 1934. Paper imports during the first four months of 1935 amounted in value to $26,408,083, compared with receipts of a value of $25,944,900 in the similar period of last year. Standard newsprint to the value of $23,146,289 in the first four months of this year comprised the great bulk of these imports, against $22,466,533 in the same time a year ago, with cigarette paper to the value of $1,073,038 the next principal item, compared with $1,380,754 last year.

EXPORTS

Exportations of paper and paper products from the United States this year are running, in point of total value, slightly in excess of shipments last year. According to U. S. Department of Commerce figures, exports during April last were valued at $1,692,976, making a total for the first four months of 1935 of $6,666,873, compared with shipments valued at $6,069,673 in the corresponding months of 1934.

Newsprint paper exported from this country in the first four months of the current year was valued at $359,409, against $422,807 in the same time last year. Uncoated book paper was exported in the four-month period to the value of $275,802, against $268,025 a year ago; exports of wrapping paper were valued at $648,743, against $591,342; of writing paper, $540,284, against $410,013; of tissue paper, $163,899, against $222,322; of toilet paper, $214,589, against $193,157; of sheathing and building paper, $78,353, against $54,936; of blotting paper, $63,400, against $59,661, and of cover paper, $67,251, against $46,984.

Exports of boxboard were valued at $324,638 in the four months, compared with $240,962 last year, while other paperboard exports were valued at $328,007, against $275,533. Shipments of paper bags reached a value of $294,430, contrasted with $223,989 last year, and exports of paper boxes and cartons were valued at $167,177, against $148,712.

Exports of paper base stocks from the United States in the first four months of this year were valued at $3,618,452, showing an appreciable rise over the shipments of a value of $2,089,129 in the same time of 1934. Sulphite wood pulp to the value of $3,021,321 comprised the bulk of these exports, comparing with $1,761,927 a year ago.

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